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UNROLLING THE MAP

THE STORY OF EXPLORATION

LEONARD OUTHWAITE

UNROLLING THE MAP

THE STORY OF EXPLORATION

WITH DRAWINGS OF SHIPS BY

GORDON GRANT

AND FIFTY-SIX SPECIALLY DEVISED MAPS

a JOHN DAY book

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TO MY MOTHER

ANNETTE O. JENNINGS

ACKNOWLEDGMENTS

the Map I have tried to be accurate and, so complete. While I do not pretend to refine- ical scholarship, the book has required more is probably apparent. Certainly the book e been written in the time at my disposal cellent facilities and assistance so generously

hank Mr. H. M. Lydenberg, Director, and e New York Public Library, who placed at e excellent research facilities of that institu- ave unfailing and courteous service through-

ure also to acknowledge my indebtedness to man, Director of the American Geograph- he book has benefited at a number of points vman's friendly interest and advice. The ap room of the Society have been of the . The map scheme of the book has bene- suggestions offered by Mr. Raye Platt and tsmanship of Mr. John Philip.

ment must also be made of the facilities excellent library of the Explorers Club and olumbia University.

dgment to the scholarly authors is too long d to report in detail here.

vill naturally understand that a history of ible only because of the careful work which olars have already bestowed on various por- tory of exploration. I may say that Profes- ker's *A History of Geographical Discovery* t was frequently used as a general reference ately, Sir Percy Sykes's *A History of Ex-* ailable only after the text of *Unrolling the* ompleted.

l to Mr. Hjalmar R. Holand for permission anslation of the Kensington Stone.

World at the End of the Classic Period is formation and a sketch map appearing in M. Cary and E. H. Warmington's *The Ancient Explorers.* The map *Islamic Expansion* is based in part on a map of Professor C. R. Beazley in the *Dawn of Modern Geography.* The maps, *The Antarctic: Cook, 1775* and *The Antarctic: 1845*, are simplified and redrafted from maps appearing in Dr. H. R. Mill's *The Siege of the South Pole,* and I am indebted to him for permission to use them. The two latter maps of this series, *The Antarctic: 1920* and *The Antarctic: 1930*, are simplified and redrafted from maps created by the American Geographical Society and appearing in their volume *The Work of the Byrd Antarctic Expedition, 1928-1930* by W. L. G. Joerg.

Mr. Edward Calman, under my direction, built up the silhouette maps, and I am indebted to him for great patience and care in carrying out a complicated task. Miss Dorris Walker was of assistance in the transcription and organization of the manuscript in its early stages. Miss Esther Berkowitz has been of the greatest assistance, not only in the preparation of the manuscript but also in assisting in library research, in organizing the manuscript, in proof-reading, and in many other directions.

In many ways this has been an experimental and novel book, and I insist, therefore, on making special mention of the cooperation and courtesy that Mr. Richard Walsh and the staff of the John Day Company have continually exercised in making this volume complete and practical and to giving it a pleasing form.

Finally, for my own part, I am sure that no volume of this sort would ever be completed, were it not for the encouragement and pleasure that the author finds in talking the project over with his professional and personal friends. Some score of these are already conscious of my indebtedness to them, but I want particularly to mention Professor John Coss of Columbia University for his careful reading of, and suggestions regarding, the Classical and Medieval sections of the book.

LEONARD OUTHWAITE

December, 1934

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FOREWORD

UNROLL THE MAP OF THE WORLD. Look at it as it lies before you. How simple—how complete!

There it is—a plain statement of fact. Neat, precise, accurate! The parallels of latitude and the meridians checker the great oceans and the continents. There they are, the seas and rivers defined; the cities located; the mountains surveyed. Are you going to Siam this winter? This map will tell you how to get there and will even show you what sort of a country you may expect to find on your arrival. This map is real, unvarying; useful because it is static.

But the map does not have to remain static. Properly used a map reconstructs a scene, it becomes the point of departure for the imagination. A map of the world ceases being a thing of two dimensions laid down on a sheet of paper; it becomes real as the world it represents is real; the countries spread before you in a green of woodlands or the reddish brown of deserts; the continents begin to creep and rustle with mountains; the rivers shimmer like quicksilver, and wind and flow; the seas, just perceptibly quivering with tides, sweep around the curve of the world. In the tail of your eye you catch the flash of an ice-cap at the pole.

With an itch for accuracy a geographer will probably tell you that this is a false picture, that seen on the proper scale the globe of the earth would show none of these things, only different intensities of light. In the *News* Building in New York, there is a revolving globe 12 feet in diameter. Even on this scale the world would look almost as smooth as a sphere of polished metal. Even the height of Everest would show only as the slightest irregularity in surface, $\frac{1}{10}$ of an inch in height.

Yet this smooth world is not a static thing; it lives and the map that represents it has had a life of its own. Take your map or your globe and ask how it was in the past. What did other ages know of their world? What men, what struggles, what flesh-and-blood hopes and fears, what agonies and joyful adventures went into the making of the world as we know it today?

Let your mind go back! Suddenly as you look at the globe it begins to change. Those areas at the Antarctic no longer shine with ice-fields and mountains and the Ross Sea; they just go blank, and this happens also at the North Pole. Dark areas appear in South America, in Arabia, in Central Asia. A black blot suddenly develops in Africa and grows with astonishing rapidity. And now, as we go back in time, we see a pall of clouds has developed over the Australian desert, where clouds have never been seen before. But these are not rain clouds; they are clouds of ignorance, the murk of the unknown.

The rack sweeps over the Pacific. Siberia, Alaska and a great part of Canada are blotted out. A finger of mist reaches down the Rocky Mountains and spreads eastward over the plains. For a passing moment the Mississippi Valley is clear, and you can still see a little strip of light falling upon the California coast. There is a lingering light along our Gulf Coast. Florida shines for an instant and is gone.

Mexico is darkening. South America is covered save for a rind along the eastern seaboard; a lightning flash across Brazil vanishes as Peru also goes out. The line of light that has hung over

Magellan's Strait suddenly collapses in a darkness which flashes up the eastern shore. For an instant, as you look through the billows of darkness at the West Indies, you see that your globe beneath is shrinking rapidly. Suddenly the clouds roll together. A continent has vanished and the space where it has disappeared continues to shrink so that Cipangu (Japan) and the shores of Asia, in vague and fantastic outline, creep into place where America was. This continent also begins to fade.

In the meantime, on the other side of the world a similar storm has been brewing. Most of Africa is gone already, and that black spot in Central Asia has joined with the vast dark area over Siberia. The general pall has closed in until there is only this silvery flood of murky and shifting light which plays over the eastern end of the Mediterranean basin. What a queer flat world—a sliver of a world—back 3,000 years before Christ!

Rushing back this way in time we have watched the world shrinking to the few little flat spots on the map where early empires, emerging from barbarism, look across their little territory and see a rim of hostile people and beyond that rim the fringes of outer darkness. Here our story starts. Beginning with these little centers about the Mediterranean, we watch the adventures of men, the growth of knowledge. Maps are in fact records of progress; the growth of the map is a condensed history of the world.

In this book we see the map as a growing thing. We see the lines of exploration like vines and branches pushing out into an unknown and foggy air. We see little parties of colonists striking root in a still, dark soil. These are growing tips of human history. In this book we see the history of human adventure growing as we might see it grow if we could photograph it in a super moving-picture camera and if we could project it now with an incredibly speeded-up flow of time.

Viewed in this way, history rushes along. It grows so fast that events run together. It has an organic, impersonal sweep. Men are there in this story—great men, they shine like buds and flowers on a tree. Lesser men, like myriads of leaves, draw air and life, but in an instant—in a season—they flash and fall and are mold. But the tree of knowledge keeps growing century by century; it adds a ring—new bark, new branches, new leaves. Man pushes out—science grows like a vine covering the earth.

Why should we begin with the people at the eastern end of the Mediterranean and on the land-bridge between Asia and Africa 3,000 years ago? Is this not arbitrary? Yes. But all history is arbitrary. It accepts a personal history, a prevailing philosophy or even a group of popular half-mythical stories as a focus for a record of events. We cannot escape a point of view. Our story must have a beginning and an end. In a wealth of controversial matters, it must select, interpret and pass on without too much debate or the sweep and interrelation of events which we chiefly strive for are lost.

But our choice is not without good reason. We begin here because, for better or for worse, we recognize that these people contributed a stream of ideas and experiences which have cut their way through the landscape of time. These people had the habit of preserving in writing the records of their history. By devious and sometimes broken channels, their living waters have flowed down to join the great sea of modern knowledge. We recognize this heritage as our own.

This is not to deny that in other times and in other places considerable bodies of geographic knowledge may have grown up. For thousands of years before our story begins, tribes or groups of men were scattered all over the face of the earth, living in unsuitable as well as suitable territories. Here and there kingdoms and empires arose. Now, the extension of an empire involves trade and the collection of taxes, and these imply an organization of knowledge about large portions of territory into a rough kind of geography. Before the Spaniards came to America the Incas already had a road that ran for a thousand miles and they controlled a vast empire. The Aztecs and the Mayas had considerable geographic knowledge, calendars and even pictorial methods of writing, most of which were destroyed by the Spaniards.

All these little pools of geographic knowledge have sunk into the ground or dried up. The records, where there were records, have largely disappeared. Those that remain are not very intelligible to us. They had no common knowledge, their people never ventured very far afield. But the stream of discovery that began in the Mediterranean basin flowed out over all the world.

About the Maps

There is a natural connection between the making of discoveries and the making of maps, but the relationship is not always the one that seems most natural today. In the past the mapmakers and the adventurers set about their work from such different points of view and with such different backgrounds that they were often at odds. Sometimes the scholars were ahead of the adventurers and sometimes they were behind.

We think it natural today that a man should climb a new mountain, explore a river, survey a coast line, and on his return should report his findings. We suppose that these become parts of subsequently issued maps. Sometimes it actually works out this way.

But this has not always been the case. Indeed, we must remember that in former times it was very difficult for experience and concrete fact to obtain a foothold in the realm of learning. Some discoveries had to be made repeatedly before unattractive plain facts could win their passport into the green but formal land of theory. The making of the map was a long, tough struggle and there were many delays and detours on the route that brought it to its present perfection.

For this reason the reader, if he can, should turn to a collection of old, historic maps. Such a collection will show what was known about the world at different times. Each series of maps in this book show as closely as we can on a modern map of the world where the various explorers actually went. The ancient maps will show how the world looked to the explorer and his contemporaries and will show what men thought they were doing, which is often quite different from the story of what they actually did.

Looking back at the medieval maps, we realize that these were a blend of things known and things believed, in which the conviction often outweighed the knowledge. The maps were the products sometimes of priests, sometimes of philosophers, and these were men that believed passionately even things that they did not know. Quite often the greater the passion, the less the knowledge. Nowadays, maps and charts are useful tools to us if we wish to go somewhere and have a look at things, but there was a time when maps prevented many people from looking at the world about them with understanding eyes. For many years maps gnawed like blind mice at the root of adventure.

Our own series of maps is the simplest and yet the most comprehensive set of diagrams that we could devise to show where the explorers went. The story of exploration is really very complicated and the purpose of our maps is to show the relationship in time and place between different discoveries rather than the details of any one trip.

Occasionally the travels of explorers are shown on maps in history books. I have often looked at these maps and found that so many routes of so many explorers, working at different times, are crowded into one map that they all grow into a snarl. Indeed, it is trying to undo such snarls that is partly responsible for the making of this book. I have tried to devise a method of showing simply and in dramatic form how much of the world was known at the time of the various explorers and to show on individual maps where each explorer, or group of explorers, went and what they added to the map. *I have done this by showing in a black outline on a white surface the parts of the world that were known and in showing in white outline on a black surface the unknown. Routes of travel or of exploration about which there was doubt are shown by broken lines; areas that were once known but had later been forgotten are shown as white but with lines drawn across them. They are in the twilight zone of knowledge.*

The basic map was drafted particularly for this purpose by Mr. John Philip, chief draftsman of the American Geographical Society. Of course, neither Mr. Philip nor the American Geographical Society is responsible for errors in judgment or for historical facts which I have put upon this map, but their assistance has been of great help in clarifying the story I have to tell.

We have chosen the Mercator projection because it is old and familiar. It was devised by Mercator only 50 years after Magellan had first demonstrated in practice that the world was round. The Mercator projection shows the whole of the world spread out as an oblong instead of a sphere. It permits us to trace continuous lines to show the routes of exploration, both by land and sea. Also if a man sails true east or west, or true north or south, his path shows on the map as a straight line.

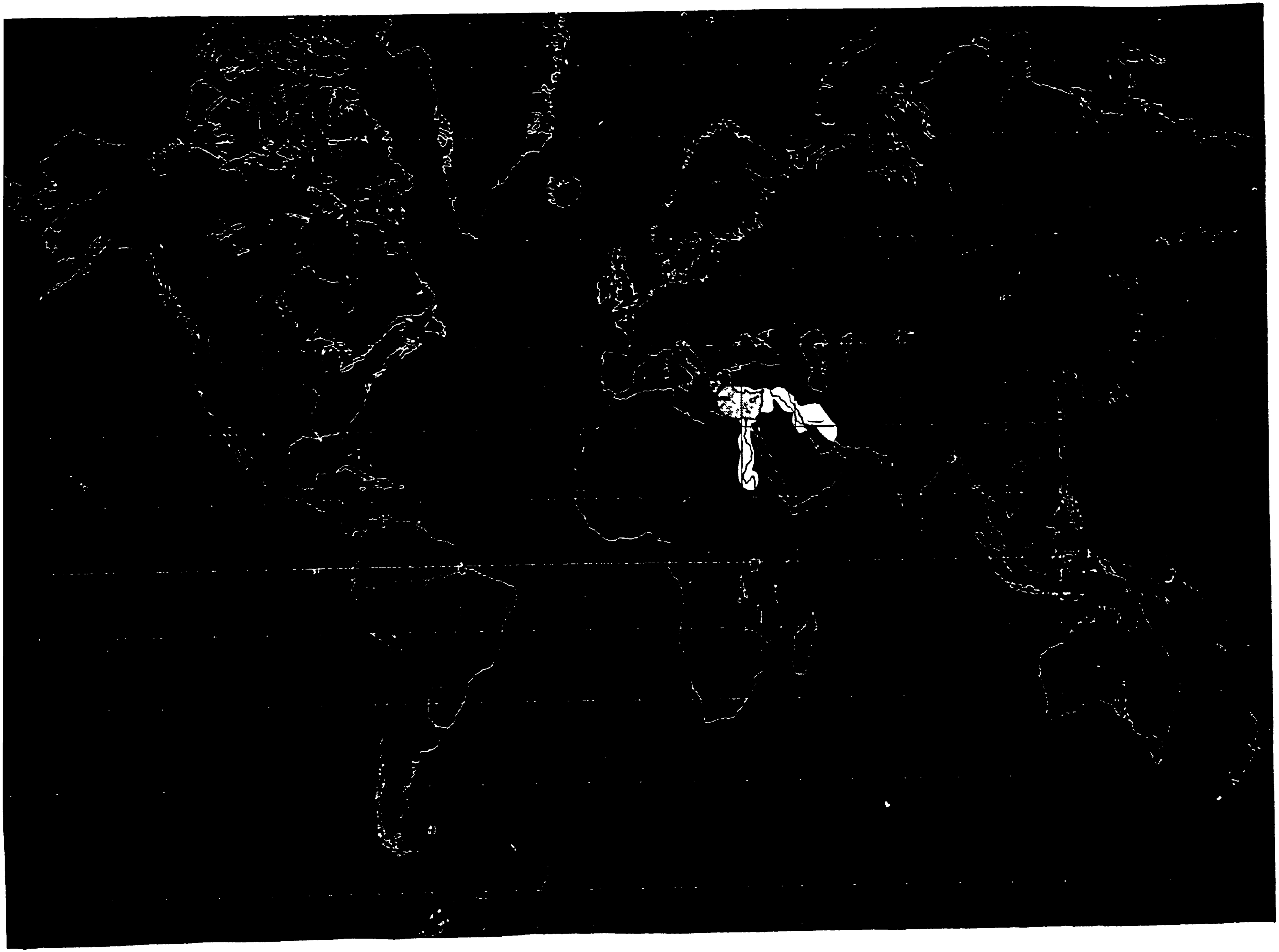
Like so many other important and useful things in life all maps are a compromise with error. Error must always arise when we attempt to show what is actually a rounded surface, the whole or a part of the globe, reduced to a flat sheet of paper. If the part of the world that we are dealing with is small, of course the error is small, but when we try to represent the whole world on a page of a book we run into difficulties. Our Mercator map has advantages but it does not escape error. The error in the Mercator projection is this: the world appears as stretched out at the North and South Poles where it should actually contract, the meridians running parallel to each other instead of converging to meet the Pole. Let us take some examples:

On our map the distance from Bergen in Norway to the southern cape of Greenland, both lying in 60° N. latitude, appears to be about the same as the distance from the Canaries to the Bahamas. As a matter of fact, had the Norsemen sailed a straight course for Greenland they would have traveled only four-sevenths of the distance that Columbus sailed from his departure from the Canaries to his landfall in the Bahamas. In areas the same type of distortion creeps in. The island of Marajo, which lies in the mouth of the Amazon River and on the equator, shows on our map as little more than a small circle but is actually about 20,500 square miles in area. It is almost the same size as Santo Domingo-Haiti in the West Indies, lying on about 20° N. These two islands together would make up a land-mass almost as large as Iceland, which shows as a conspicuous feature on our map. North of Iceland and south of the Horn the distortion of areas and distances becomes very great indeed. So we have made separate maps on a different pattern for the North Pole and the South. And now that we know the tendency to error in the Mercator maps we can make proper allowance in our minds and get on with the story.

PART I

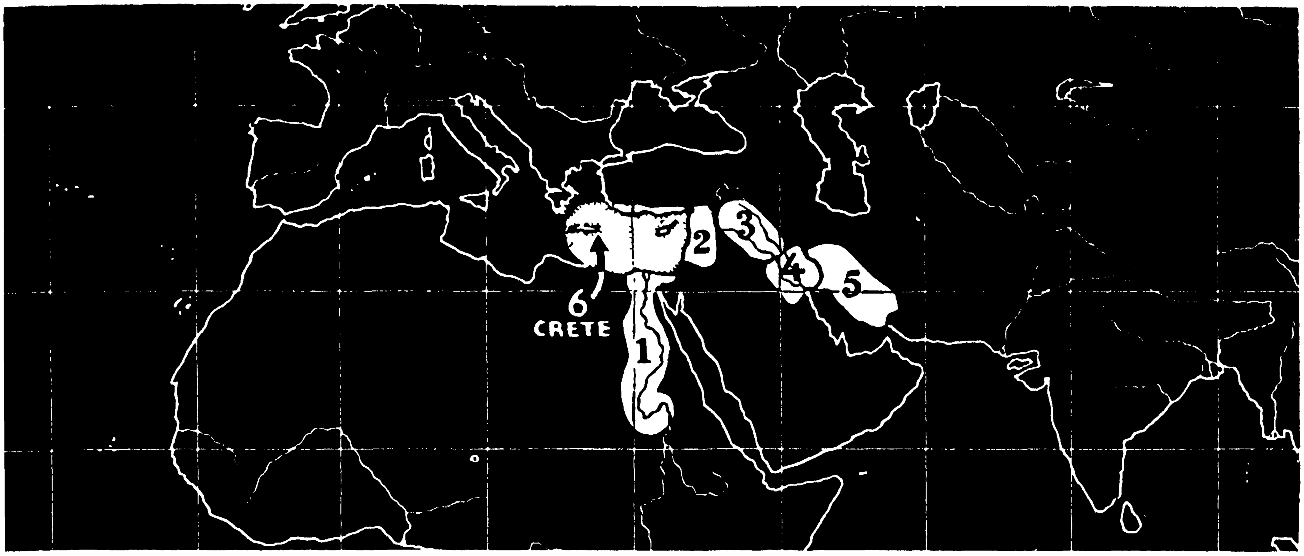
THE FIRST EXPLORERS

The Classic World



THE WORLD—3000 B C

Home of the early empires at the eastern end of the Mediterranean and in Mesopotamia.



THE EARLY EMPIRES

(1) Egypt and the Nile. (2) Phœnicia—Cities, Tyre and Sidon. (3) Assyria—City, Babylon. (4) Sumer—Cities, Ur and Eridu. (5) Elam—City, Susa. (6) Minoan Culture—City, Cnossus on Isle of Crete.

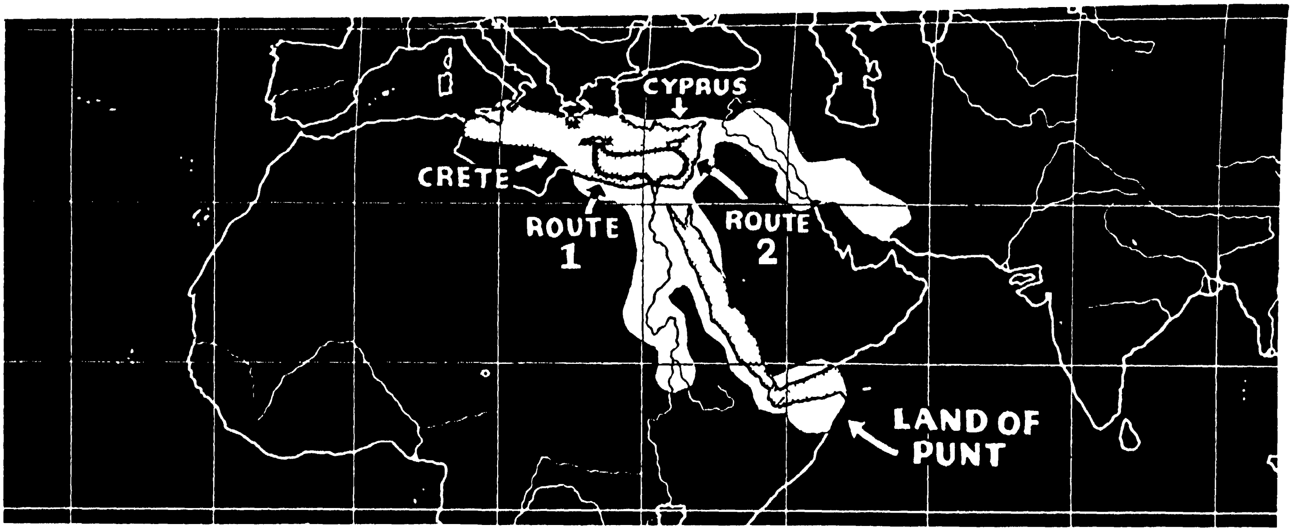
THE EARLY EMPIRES (3000 B.C.)

THE earliest explorations that are known and definitely recorded begin about 3000 B.C. and are found among the advancing civilizations at the eastern end of the Mediterranean and nearby portions of Asia. When we say that peoples of these early empires were civilized, we mean simply that they were living together in cities and towns and that these were stable. We mean that they had developed permanent houses and large public buildings. Most important of all, they had invented systems of writing. These people not only traded and traveled, but they also left us definite records of their activities. It s from these times that we can trace the beginning of our accumulative fund of information that has been growing through the centuries and has at last taught man the general character of he world he lives in.

By 3000 B.C. Egypt already has had a long history. We have known Egypt longer and we have tudied her records more carefully than those of other people. But Egypt was not necessarily the only cradle of civilization. When we have studied eastern Persia as long and as carefully as we have now studied Egypt, our knowledge about the origin of culture will undoubtedly be greatly extended.

Outside of Egypt there was another and growing center of culture among the Phœnicians whose cities were Tyre and Sidon. The Phœnicians were to emerge a little later as a great maritime people. There was a center at Assyria with the cities of Nineveh and Assur and a center in Sumer, near the mouth of the Tigris and Euphrates, with the cities of Eridu and the famous Ur of the Chaldeas. Beyond Ur there was the land of Elam in eastern Persia with the city of Susa and other cities in Persian territory that are certainly very old indeed. Finally there was the island of Crete in the Mediterranean which was the center of the very ancient and curious Minoan civilization.

Now there is evidence of local trade by land and also of trade borne by boats up and down the Tigris and Euphrates rivers. In Egypt there are drawings of ships upon the Nile between 6000-5000 B.C. But we do not have definite records of trade and travel between these various centers. There is archeological evidence that in early times these civilizations may have had influence one on the other or that they may have derived their ideas and arts from some common source. But the evidence of direct and extended travel is not yet clear enough to be worth discussion. We turn then to Egypt.



MINOANS TO EGYPT
Route 1. 3000 B.C. to 1500 B.C.
Route 2. After 1500 B.C.

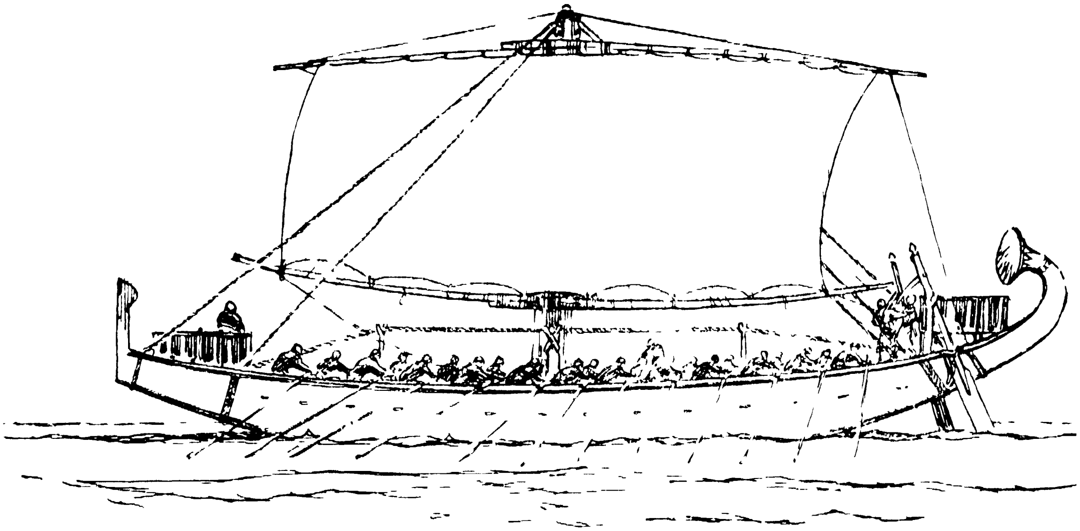
EGYPTIANS TO PUNT
2750 B.C. and 1500 B.C.

EGYPTIAN EXPLORATION—THE VOYAGE TO PUNT, 2750-1500 B.C.

HIS name was Hannu and he was the first explorer of whom we have any historic record. In 2750 B.C. when King Sahure was reigning in Egypt, he made a remarkable journey, traveling over hills, across a desert, sailing on a distant sea, and visiting strange people.

In some ways Hannu set the pattern which so many later explorers have followed. Distant voyages are expensive and explorers are usually poor, so they must have a financial backer or patron. Hannu's backer was no less a person than the King. When he had completed his trip which took him to the very limits of the known world, like many a later explorer, he felt he was entitled to a good share of publicity and recognition. So at the Egyptian city of Hamamat from which he started and to which he returned, a spot 420 miles up the Nile above Cairo, he caused his name and a description of his trip to be carved in the great rocks which have proved so much more enduring than the books and newspapers to which later explorers have committed the stories of their ephemeral triumphs.

Hannu's expedition started from Hamamat,



EGYPTIAN SHIP

THE earliest possible drawing of a ship of exploration would be that of one of the vessels constructed at Punt which sailed back to Egypt in about 2750 B.C. There are indeed representations of Egyptian vessels of about this period and of earlier vessels that were probably used only on the Nile. The earliest drawings of ships are on Predynastic pottery. The ships are already well developed, the forerunners of the ship in our drawing.

This is a drawing of one of the vessels used on the second known Punt expedition under Queen Hatshepsu of about 1500 B.C. The drawing is based on tomb carvings describing that expedition. This is already a developed ship. Earlier vessels were driven by paddles, but by this time they are rowing with oars and with their backs turned to the bow of the vessel. The vessel is steered with one or two rudders that are really enlarged paddles, but they are ingeniously mounted on pillars at the stern and slung in heavy ropes and have a bar which foreshadows the later use of the tiller. The vessel is already provided with a mast and with a square sail mounted on upper and lower yards. The sail is raised by hoisting the upper yard. It is controlled by ropes, corresponding in a general way with halyards, which raise the yard and braces, which trim it.

Since these vessels were shallow in draft and without keel and since the paddle-rudder was not very effective, we know that the sail could be used only in favorable winds.

A distinctive feature of the Egyptian vessel was the elaborate and heavy rope truss supported on two crutched poles. A double sling of ropes forming the truss passed around the raised bow and stern of the vessel. It gave longitudinal strength and prevented the ends of the ship from sagging and the midship section from being thrust upward (hogging). This truss is an ingenious device. It does not necessarily reflect lack of skill on the part of the Egyptian ship-builders but was probably due to the fact that timber was and is scarce in Egypt. There were no trees large enough and strong enough to provide proper keel pieces. We know that later Egypt sent to Lebanon for ship-building materials. Lack of timber may also be the reason why the Egyptians later more or less withdrew from the sea and left sailing and trading to the Minoans of Crete, the Phœnicians and the Greeks.

climbed through the cliffs and hills of the eastern bank of the Nile and worked its way across the desert to Kosseir, a port on the Red Sea. From here Hannu went to the land of Puoni or Punt. Punt was the region at and beyond the southern and eastern end of the Red Sea and it included apparently a part of Abyssinia and a part of Somaliland and the Arabian coast opposite them. Hannu says that he had ships built in Punt for the return journey, so the inference is that he made his outward journey by land and returned by sea. Here in the explorer's own words is part of the world's first record of an exploring expedition:

> "I was sent to conduct ships to the land of Punt to fetch for Pharaoh sweet-smelling spices, which the princes of the red land collect out of fear and dread, such as he inspires in all nations. And I started from the City of Coptos [Kosseir], and his Holiness gave the command that the armed men, who were to accompany me should be from the south country of the Thebaid. . . . Then I arrived at the port Seba, and I had ships of burden built to bring back products of all kinds. And I offered a great sacrifice of oxen, cows and goats. And when I returned from Seba I had products which I had met with in the ports of the Holy Land [Punt]. And I came back by the road of Uak and Rohan, and brought with me precious stones for the statues of the temples. But such a thing never happened since there were kings; nor was the like of it ever done by any blood *relations who were sent to these places since the time [of the reign] of the Sun-god Ra. . . .*"

It says, further, the expedition brought back 80,000 measures of myrrh, 6,000 weight of gold-silver alloy, 2,600 staves of precious wood, probably ebony.

Queen Hatshepsu in about 1500 B.C. sent another expedition to Punt. This expedition went and returned in Egyptian ships. Among other things it brought back live myrrh trees for the planting of a terrace-garden of incense trees at the temple of Amon. It brought back also a live leopard, especially caught for the Queen, and many panther skins. At Der-el-Bahari where the records and pictures of the whole expedition are carved in the temple walls it says:

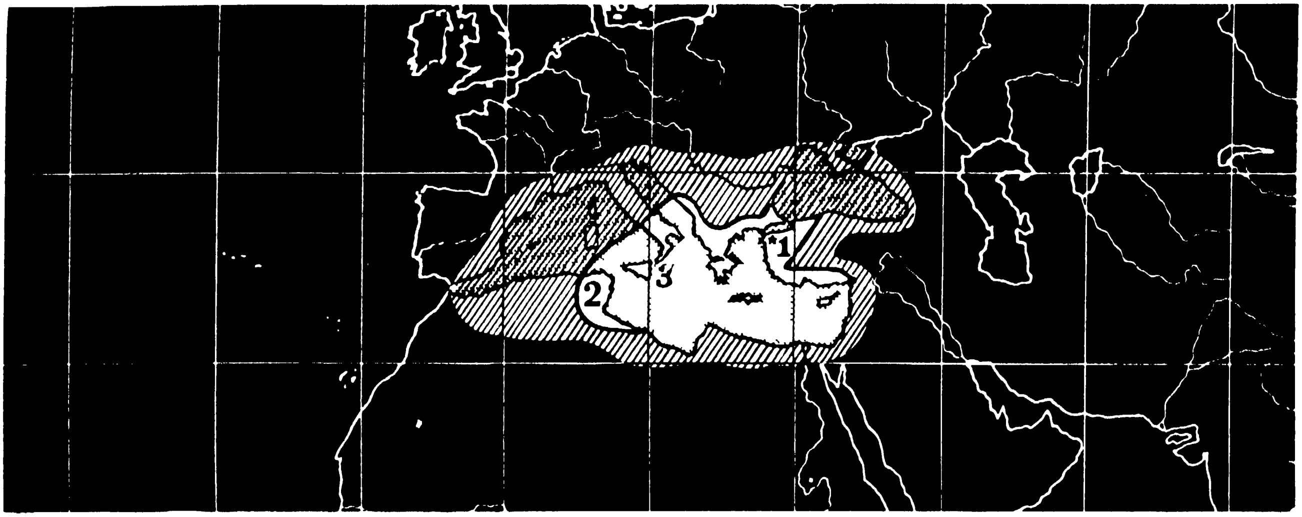
> "The ships were laden to the uttermost with the wonderful products of the land of Punt, and with the different precious woods of the divine land, and with heaps of the resin of incense, with fresh incense trees, with ebony, [objects] of ivory set in pure gold from the land of the 'Amu, with sweet woods, Khesit-wood, with Ahem incense, holy resin, and paint for the eyes, with dog-headed apes, with long-tailed monkeys and greyhounds, with leopard skins, and with natives of the country, together with their children. Never was the like brought to any king [of Egypt] since the world stands."

The final boast is, as we know, twelve centuries too late to be quite correct.

THE MINOANS, 3000-1000 B.C.

THE Minoans were the earliest of seamen in the Mediterranean. They sailed to Egypt just as the Egyptians sailed to Punt. They were an island people on Crete and their whole civilization depended on the use of ships. Even the carved stones they used for seals carried more often than anything else the picture of their ships.

They traded with Egypt and we know the way their ships traveled. By 2000 B.C. Minoan pottery is fairly common in Egypt. By 1500 B.C. it is common also in Cyprus. It seems therefore that the first venturesome Minoans sailed the short distance straight south to the African coast and followed this eastward to the Nile. Later they discovered Cyprus and passed this way and by the eastern coast to Egypt. They sailed westward also and reached Sicily and southern Italy, for their coins are found here by 1200 B.C. They passed through the Strait of Messina, for from the Æolian (Lipari) Islands, just beyond, they took a special kind of stone which went into their great palace at Cnossus. They may have passed the Strait of Gibraltar and been the first to reach Tartessus at the mouth of the Guadalquivir in Spain. But by the year 1000 B.C. their voyaging had ceased. The Achæan and Dorian raiders had swept down on them and what was left of their story became part of the Greek heritage.



THE WORLD OF HOMER

(1) City of Troy. (2) The Lotus Eaters (Tripoli Coast). (3) Scylla and Charybdis (Messina Strait). Just west of this point lie the Æolian Islands (Lipari Islands). The shaded area Homer possibly knew by name but peopled with fantastic shapes. All about beyond ran the great Ocean River.

THE EXPLORER ULYSSES

THOUGH its facts are questionable, its geography confused, its navigation absurd, the *Odyssey* remains one of the great books of exploration. Ulysses as he is pictured by Homer is plainly enough an explorer and seaman.

The *Odyssey*, of course, is one long traveler's tale. We expect adventure and exploration and geography in the story of Ulysses. But in the *Iliad*, also, we are often reminded of the voyage that brought the Greek company together and we sense the importance of the ships to the armies before Troy. The Greek warriors are also sailors; and even in the midst of battle on the Trojan plain we become unexpectedly aware of a wind blowing in from the sea.

Where did Ulysses go on his wanderings? Hundreds have tried their hand at the sport of constructing a route for him. It is a nice, scholarly sport, but style and luck count in it more than solid facts. No one can know accurately where Ulysses was supposed to go on his travels, for Homer himself did not know.

Homer put his story together from many sources, some purely Greek stories, some stories *and traditions taken over from the Minoan sailors. Myths from many people embellish the great tale. Out of it all Homer selected on the basis of artistic purpose, not on that of historic or geographic accuracy.*

The Greek islands and the plains of Troy Homer knows. Here is relative reality. Beyond that, three definite localities can be reasonably assigned as forming the scenes of certain more imaginative passages in Ulysses' travels. Scylla and Charybdis are a dramatized and exaggerated description of the Strait of Messina with its characteristic currents; the Æolian Islands are the Lipari Islands; the land of the Lotus Eaters, a portion of the Tripoli coast, for here a form of the lotus was eaten and regarded as a delicacy. It would be nice to know if the lotus has narcotic properties but there seems to be no evidence on this point.

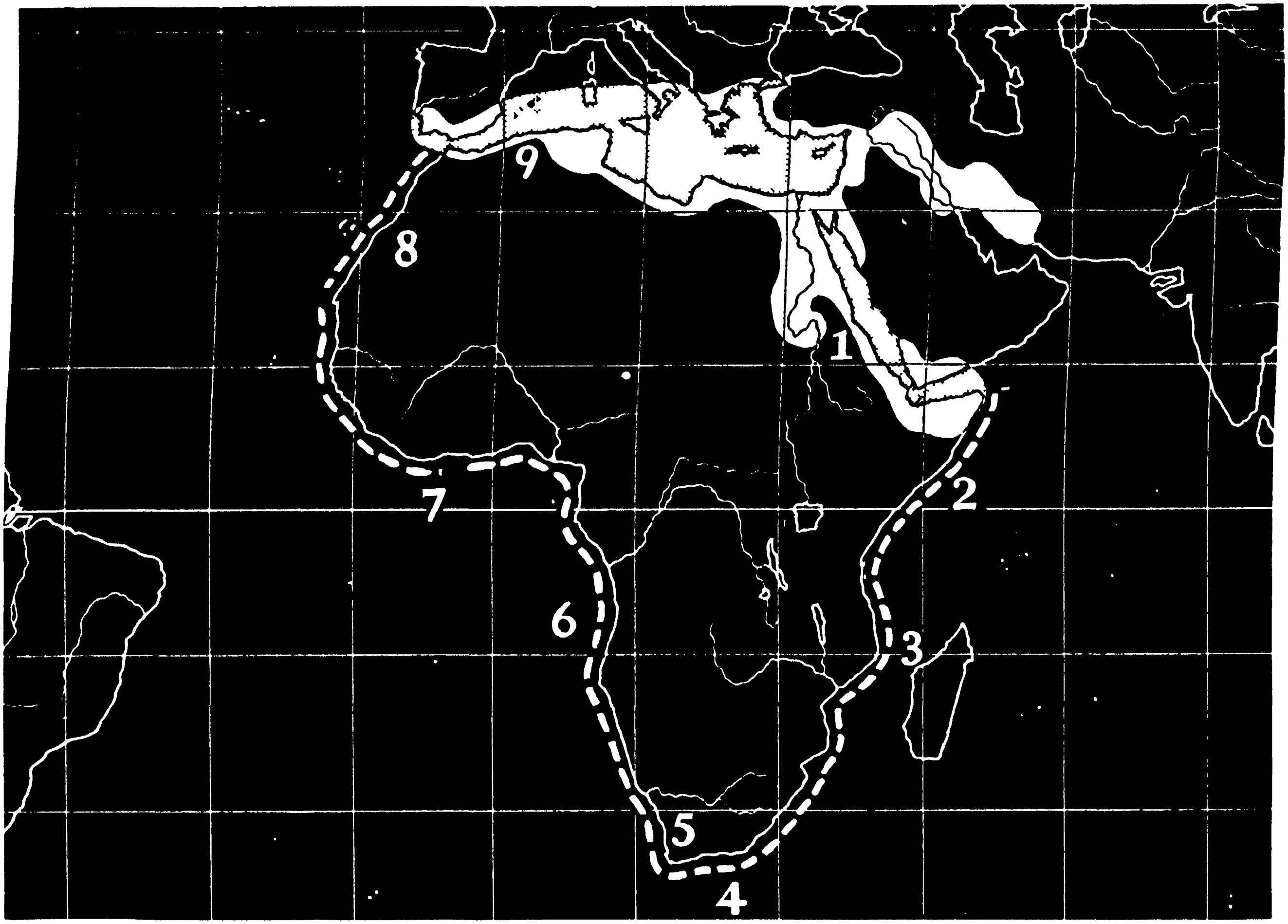
Beyond, Homer's geography gets vaguer and vaguer. Phœnicia and Cyprus and Egypt are shadowy. He has in mind a general but distorted picture of the Mediterranean shores. The places are there but their relations are askew. He knows of the Black Sea but not what lies beyond it. He sees the whole world as a flat disk with the Mediterranean at its center, the countries forming its shore. Travel only a short distance from the shore and you become lost in the lands of storm and mist and fabulous monsters. A step too far and you may find yourself at the door of Hades. Sail beyond the known landmarks and you are the sport of Neptune, who rules the "river of ocean" that flows all about the outer world.

But this is very different from saying that there is no reality in Homer. What is real in him is some knowledge of ships and of their management; a clear picture of weather and sailing conditions that are characteristic of the Mediterranean. What is real also is a vivid and recognizable portrait of Ulysses as an explorer, adventurer and seaman. Ulysses professes that he wishes to get home, but he succeeds in spending ten years and one hundred adventures in the process. He complains and frets and calls out for Ithaca when he is held by calms and cranky tides or a mean spell of head-winds. Yet when the fair winds come and his ships are in order, he succeeds only in setting out for a new port on a new adventure. It is curious too how each port contains a lady, each fairer and more seductive than the last. It is no use crying "the Gods, the Gods are to blame!" The Gods are only a name that we give to man's desires.

Like a true captain Ulysses grumbles, complains and abuses his men. Yet he has a fondness for his vessels and for his crew, and he looks after their welfare. He expects no more of them than he expects of himself. In fact, when the sirens begin to sing he is willing to expose himself just a little more than any other member of the crew. Perhaps even in this he is not dissimilar to adventurers that came after him. It could hardly have been a shortage of wax that prevented him from stopping his own ears, and our only regret is that he never told us what song the sirens sang. His picture of seamen in the hands of Circe becoming pigs in port is an allegory recognizable to any sea captain.

You remember when Ulysses finally came ashore, the Phæacians held great games and races in his honor and he was challenged to compete. Only a sailor speaking to a nation of sailors would have said as he did then, "Only I doubt that in the foot-race some of the Phæacians may outstrip me, for I have been shamefully broken in many waters, seeing that there was no continual sustenance on board; wherefore my knees are loosened."

What happened to Ulysses in his closing years? Did he fuss around Ithaca, a rusty, crusty fellow? Or did he fit out his ship again and sail as he had hoped to do, beyond the "Pillars of Hercules"?



THE PHŒNICIANS AROUND AFRICA UNDER KING NECHO, 600 B.C.

(1) Red Sea November (2) N. E. Monsoon and Current (3) Mozambique Current (4) Agulhas Current (5) St Helena Bay June to November raised wheat (6) December—Second Year S. E. Wind. Benguela Current (7) March Calms Adverse Guinea Current (8) Morocco December to June wheat (9) Pillars of Heracles Favorable Current Home third year

THE PHŒNICIANS

Around Africa under King Necho, 600 b.c.

OUT of remote time comes the record of a tremendous exploit undertaken by a nameless group of Phœnician sailors. This is the story of a three-year cruise around the whole shore of the African continent. If the story is accepted, we have before us a daring adventure which, for persistence and endurance, rivals anything in ancient or in modern exploration. Since the names of the men who performed the trip are unknown to us, we should give credit to King Necho of Egypt who around the year 600 b.c. developed the idea and gave the orders that sent the men off on their great adventure. Let us begin with what is positively known. The information that we have comes to us from the Greek writer Herodotus, who was in Egypt about 150 years after the trip is supposed to have taken place. The record is a short one, and we cannot do better than to quote the story in full as he tells it.

> *"Libya shows that it has sea all around except the part that borders on Asia, Necho a king of Egypt being the first within our knowledge to show this fact; for when he stopped digging the canal which* stretches from the Nile to the Arabian Gulf he sent forth Phœnician men in ships, ordering them to sail back between the Pillars of Heracles until they came to the Northern [Mediterranean] Sea and thus to Egypt. The Phœnicians therefore setting forth from the Red Sea sailed in the Southern Sea [Arabian Sea and Indian Ocean] and whenever autumn came, they each time put ashore and sowed the land wherever they might be in Libya as they voyaged, and awaited the reaping time; having then reaped the corn they set sail, so that after the passing of two years they doubled the Pillars of Heracles in the third year and came to Egypt. And they told things believable perhaps for others, but unbelievable for me, namely that in sailing round Libya they had the sun on the right hand. Thus was Libya known for the first time."

The canal referred to in the above passage was one of the precursors of the Suez Canal. The first canal connecting the Mediterranean and Red seas was built between 1350 and 1300 B.C. during the reigns of Seti I and Rameses II. This gradually filled with sand until it was no longer navigable. Around 600 B.C. Necho started a canal between Bubastis on the Nile and the Red Sea. Although 120,000 Egyptians perished digging this canal in Necho's reign, it was not completed until the time of Darius Hystaspis (521-486 B.C.).

The fact that Herodotus first tells the story over a century after it is supposed to have happened does not necessarily mean that it is untrue. Records of events that have later been verified have persisted as living stories among people for much longer periods before being reduced to written form. The more complete records of the adventures of Hanno and other Phœnician navigators show that the Phœnicians had seaworthy ships and sufficient skill and daring to carry through extraordinary adventures. One of the most interesting points about the matter is that the very reason which Herodotus assigns for rejecting the story is one of our best reasons for recording it as probable—namely, that when this little band of mariners were rounding Africa from east to west, they "had the sun on their right hand." That is to say, when they were going westward the sun stood north of them at noon. These would be the first Mediterranean sailors to have passed below the equator and the sight of the sun to the north of them would be exactly the thing to surprise them and which they would regard as worthy of special mention. It is also the point which the Greek scholar, who had never personally had this experience, would be likely to doubt.

There are other points of importance; such as that the three years assigned for the voyage is a reasonable span for its accomplishment, and that the method of coming ashore for a certain period each year to raise grain for provision is a practical one and would have to be resorted to by ships taking so long a journey at that time.

But the essential point for the credibility of the story is that the voyage is described as taking place from the east to the west. This is by far the easier circuit for a coasting voyage around Africa. It fits in with the geographic facts. We may say that, at most seasons of the year, the winds and currents make a passage around Africa in this direction relatively easy, whereas they constitute a continual series of hardships for vessels undertaking the passage in the opposite direction.

For example, there is the story of Sataspes (485 B.C.), a young Persian of noble family who was condemned to death but was saved by a promise that he would sail around Africa. He tried to make good this promise, but he chose to sail from west to east and was so held up by head-winds and currents that he had to confess defeat. He was executed.

Another early navigator, Eudoxus of Cyzicus (about 146 B.C.), an experienced seaman, tried twice to sail around Africa from the west. The first time he was turned back and the second time he was lost. It was not until the Portuguese developed deep-water vessels and began working offshore that anybody succeeded in rounding Africa from west to east. And we shall see later what difficulties the Portuguese navigators encountered in attempting this passage. On the other hand, we know positively that Diogo Botelho, a young Portuguese, sailed from India to Lisbon around Africa in a boat only 17 feet long. At least two scholars, the German Müller and the English geographer Rennell, have offered detailed suggestions as to the conditions and times of the Phœnicians' route. We condense the voyage as reconstructed by Müller and offer a map showing the route.

> "Started late in November and rowed against the current of the Red Sea and the N.E. monsoon as far as Guardafui. Turned south and had the monsoon and drift-current behind to the Equator. After crossing Equator noticed that the sun was on their right hand, north of the ships at midday, instead of south. Swept on by the swift Mozambique current, and around the Cape by the Agulhas current. Landed somewhere near St. Helena Bay during May of the first year and planted the grain, reaping it in November and sailing on in December. Blown up the west coast by south wind and the Benguela current. Reached the Bight of Biafra late in March. Sun almost overhead when they reached the mouth of the Niger. Rowed against a S.W. wind and calms to and around Cape Palmas late in June. Then had to fight against the N.E. trade-wind and the Canaries current all the way to the Straits of Gibraltar. Passed the tropic at end of September. Landed in Morocco in November, sowed grain in December, reaped in June. Once inside the Straits, met neutral winds and favorable current all the way to the Nile."

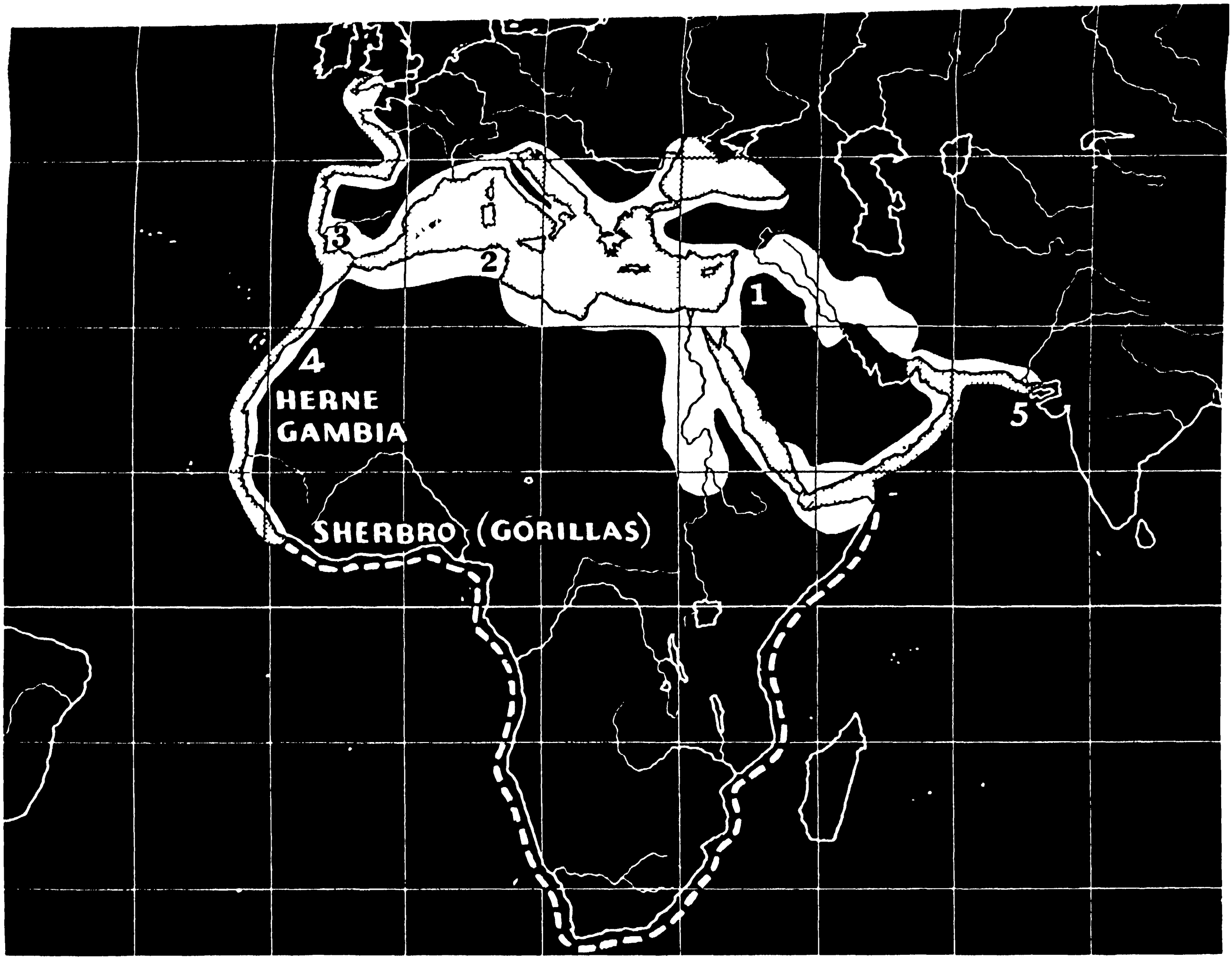
Of course, showing that the voyage might have happened is very different from showing that it did happen. In the end we only know there is no reason for rejecting the account. We will probably accept or reject it according to our individual temperament and prejudices. But what modern sailor is so crusty that he does not hope these ancient shellbacks made the long passage and came safe to port!

HANNO THE CARTHAGINIAN, ABOUT 500 B.C.

SO far as history records, Hanno the Carthaginian was the first man to visit and describe West Africa. There is a Greek translation of his own account of the trip. If this is accurate, he was one of the greatest ancient explorers, and conducted an enterprise that would be dramatic and important in any age.

A Phœnician expedition had founded Carthage some time before 800 B.C. This city was destined at its most flourishing period to be the greatest city of its time with a record population of about one million. By 500 B.C. it was already thriving and controlled a widespread trade that moved by land and sea in Africa and in the Mediterranean. In its turn it was ready to found colonies.

Hanno, then, was the leader of an official and vast undertaking, bent on conquest and colonization. It is said that he had 60 vessels, and each vessel was driven by 50 oars. The expedition numbered altogether 30,000 men and women. This certainly is an unwieldy number of people—almost an incredible number. Even at the present time with all our modern facilities for travel, the movement of 30,000 people setting out to found new cities in an unknown land would represent a heroic undertaking. But we must remember that he was founding cities as he went along and probably leaving behind both ships and men, so that when he reached his far-



HANNO THE CARTHAGINIAN (500 B.C.) AND SCYLAX OF CARYANDA (510 B.C.)

(1) Phœnicia: Tyre and Sidon. (2) Carthage. (3) Phœnician Colony: Gades—Cadiz in Spain. (4) Hanno's Voyage (5) Scylax for the Persians on a coasting voyage from India to Egypt. The line to England represents the Phœnician trade in tin.

thest point south, there would be a much smaller company with him.

But it was a great fleet of ships that sailed with him past the high dark hills of Gibraltar—the Pillars of Heracles. For two days they proceeded along the Atlantic coast and then he founded the city of Thymiaterium which in modern times is called Mehedia. After this they went on to Cape Soloeis, which is now called Cape Cantin, and here he founded a temple to Poseidon, a god of the sea. So, no doubt, a colony was set up here also and the temple was erected in thanksgiving and to insure the success of further explorations. Beyond the Cape, they went eastward and came to a great swamp filled with elephants. The swamp might be marshes of the River Tensift. There were once elephants here and many other animals that have long since retreated from western Africa.

Then they skirted the marshes and founded several more towns and came to the River Lixus, which is now called the Draa. Here they found companies of natives and made friends with them and stayed in this spot for some time. They coasted south past the barren shore of the Sahara for several days. Then on an island called Cerne, they founded another colony. Cerne is identified by modern scholars with the island Herne, not because the names are similar, for similar names might arise in several ways, but because the description of the place and the sailing distances fit together with the account of the rest of the voyage.

Hanno then reached a river, possibly the Senegal, and encountered groups of hostile natives. These may have been the Guanches, a savage and mysterious people who later left Africa and colonized the Canaries. Hanno found another river with crocodiles in it and then returned to Cerne.

But he was not ready to return home. Later he sailed for twelve days, skirting the land, and found Ethiopians, that is, black natives, and came to Cape Verde. He then took the ships around the cape and beyond it, came into the mouth of the Gambia and here saw fires at night along the shore. And they took provisions and sailed for five days until they reached a gulf called the West Horn which probably was Bissagos Bay. They landed on an island and found it unexpectedly terrifying. At night they saw fires through the forest and throughout the night were kept awake by the continuous beating of native tomtoms. They admitted being afraid and dashed for the ships and got under way, flying from the mysterious drums.

They went on and reported sailing for four days past a stream of fire. This might well have been grass or brush fires, which are not uncommon in the dry season. Over the flames they saw a high mountain which they referred to as the Chariot of the Gods and which could have been Kakulima in Sierra Leone. With the fire still continuing on shore, after three days more they reached the southern Horn (Sherbro Sound) and finally landed on Macauley Island.

Here the oddest adventure of all befell them. Hanno says that they encountered small dark men and women who chattered and ran and leaped about. They captured several of the women and the others fled. Hanno believed that the natives called these strange beings "gorillas." Of course they were not gorillas. We could hardly imagine a group of men who were terrified of native drums undertaking to capture even young gorillas. And it is also unlikely that these were real men and women, that is Pygmies. But they well might have been chimpanzees.

If the reconstruction of Hanno's trip is at all accurate, it is a remarkable performance. He would have come within ten degrees of the equator and have sailed over 3,000 miles. Nineteen hundred years later it took the Portuguese 150 years to explore the same territory which Hanno covered in one expedition.

GROWTH OF THE CLASSIC WORLD

Ten Thousand Greeks, 401 B.C.

A FUTILE military disaster added materially to the geographic knowledge of the ancient Greeks. Ten thousand leaderless soldiers, unbeaten, but betrayed and without resources, had to wander and fight their way home over some 3,000 miles of unknown territory.

The recorder of the trip is Xenophon. The adventure began in the year 401 B.C., when Cyrus, who was ruling Sardis, attempted to overthrow his brother Artaxerxes.

It appears that the Greeks from the first were deceived, thinking only that they were going to attack some hill tribes who were harassing the settled Persian plain. The early part of their route followed the so-called "Royal Persian Road," making only occasional detours from it. This road began at Sardis, went through Asia Minor to Issus, a port at the extreme northeast corner of the Mediterranean. This far the army of Cyrus followed the road closely. The road *then skirted the foothills on the northern side of Mesopotamian country to Arbela and then to Susa. Cyrus, however, cut across to the upper Euphrates, which he followed to the region of Babylon and Bagdad.*

At one point the Greeks became suspicious and refused to move. After some delay they went on to the Euphrates where Cyrus finally confessed that he intended to attack the great king, his brother. Cyrus's promises of rewards finally induced them to move again, and they proceeded. Artaxerxes defeated Cyrus in a battle at Cunaxa, in which Cyrus was himself slain. The Greek force that remained was left without support, without provisions, without local guides. Tissaphernes, a Persian, offered to guide them back. But after leading them across the Tigris south of Bagdad and into Media, he ran away, abducting the Greek generals. In this hopeless situation, Xenophon addressed the demoralized forces. He was one of those elected to lead the army from this point on. Here their wanderings, which took them into new territory, began. Kurdistan and Armenia were known to exist, but little was known of their shape, extent and character.

They followed the Tigris past Nineveh and came into the mountains of Kurdistan, fighting an action against Tissaphernes and the Kurds. By this time it was winter and the going rugged and difficult, the people hostile, the climate cold. After intricate wanderings, they passed near Erzeroum and in this vicinity found a temporary rest. This was badly needed, for they were suffering from snow-blindness and from frost-bite.

The passage through the difficult Armenian country with such a considerable force represents a remarkable accomplishment. The performance is especially remarkable when we remember that in accordance with Greek practice, a number of women, and possibly even children, accompanied the expedition and had to be provided for in some fashion. They had to cross deserts and ford rivers and forge their way up mountain passes. Much of this was done under a *series of surprise attacks from natives. Equipment and supplies were of course rapidly exhausted, beasts of burden perished, and the army had to be fed off the land.* In addition to this, the *troops, never subject to a very vigorous disci*pline, were by this time diseased, fatigued and demoralized, and there was also dissension among the various leaders. The judgment of Xenophon, according to his own statement, prevailed. He had need for all the knowledge and forbearance that he had learned from his teacher, Socrates.

On the march again, they mistook the direction of the flow of the Phasis River and the sea into which it emptied. They were trying to make their way westward but followed the river eastward to near the city of Kars on the Kars plain. Then, turning west and north, they came to Gymnias where they were told of the Greek city of Trapezus on the Black Sea. Five days later, coming over the summit of Mount Theches, they saw at last that there were no other hills before them. The ground dropped away to a plain and beyond the plain a gleam of level water. The advance guard put up a shout, "The Sea," and the rear guard came tumbling up, thinking they had been attacked again by the barbarians. Then men and generals clapped each other on the back and wept and shouted, for to the Greeks the sea was almost home.

They descended to Trapezus, where they rested a month. Of the 10,000 that had started, only 8,000 reached here. Finally they followed the shores of the Black Sea back to Byzantium, going part of the way by land and part by sea.

Xenophon wrote: "The whole of the way, both of the expedition and retreat, consisted of two hundred and fifteen days' march, of eleven hundred fifty-five parasangs, and of thirty-four thousand six hundred and fifty stadia; and the time employed in both, of a year and three months." (3 1/3 miles to a parasang.)

In this strange manner did the classic world become acquainted with Armenia and in general with the country between the Euxine (Black Sea) and Mesopotamia.

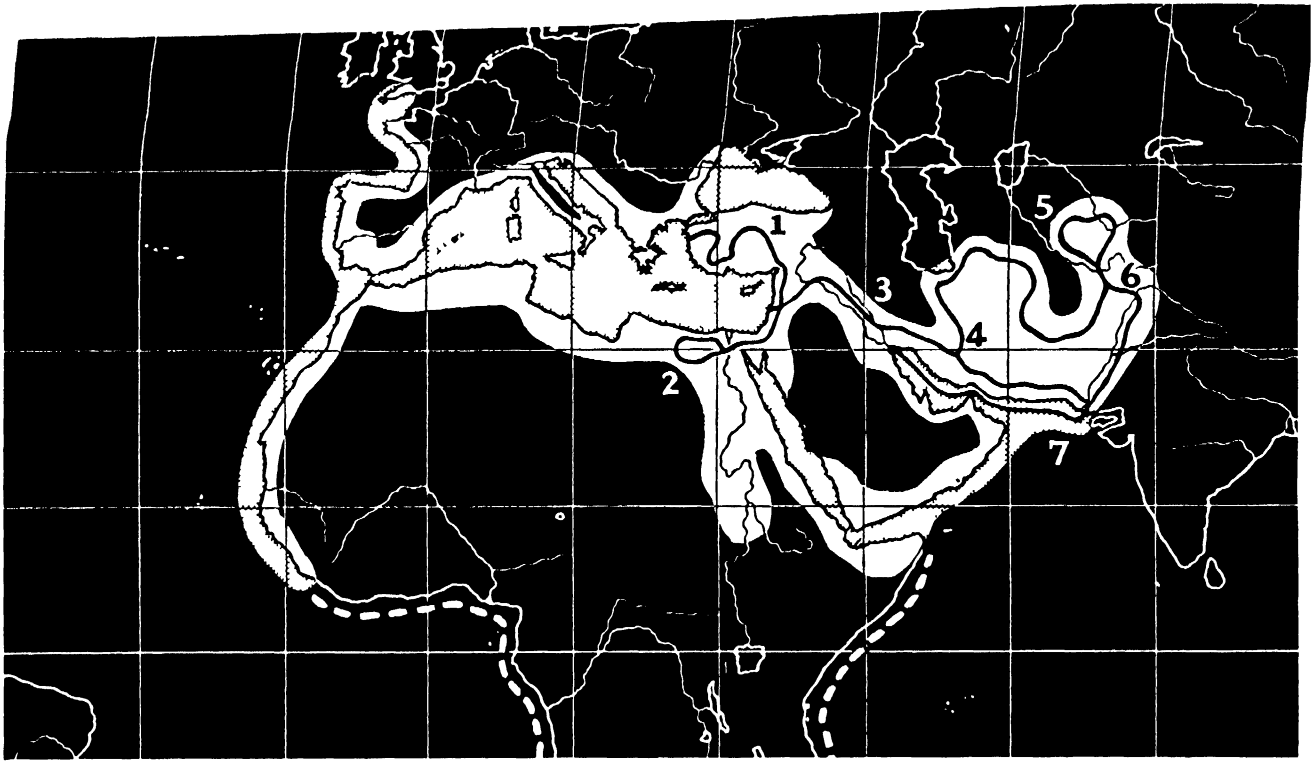
ALEXANDER THE GREAT (356-323 B.C.)

It is said that Alexander wept because he felt there were no more worlds to conquer. It is curious that after so many years this single sentence leaves us with so clear a picture of a young, brilliant, courageous, ephemeral and slightly psychopathic individual. Alexander marched from Greece to unknown India with a long succession of multiple military triumphs. But he never succeeded in making his conquests stick. He moved with a great army and great following of people. He ordered the founding of scores of cities, all of them named, by him, Alexandria. With one or two notable exceptions none of them are known by that name today. He established a score of kingdoms and of provinces in Asia none of which remained for more than a few years a part of the empire he strove to found. He was a conqueror of foreign peoples without ever being a substantial ruler of his own people. He traveled so far afield that he spent himself and died before he ever returned to his own place. Alexander was an explorer. The greatest contribution he made was to carry for a while the influence of Mediterranean culture eastward and bring the influence of eastern culture into the Mediterranean. He enlarged the horizon of the classical world.

It is not important here to consider Alexander's successes as a military man, but it is important to gain some impression of his extraordinary activity as a traveler. To do this we must remember that in this time Greek knowledge of geography was restricted to the shores of the Black and Mediterranean seas. The 10,000 Greeks had marched into Mesopotamia and returned with reports of their journeying through Armenia. The Greeks knew about Persia and parts of Arabia but had never penetrated either country. What lay beyond them was a matter of fable and vague vision.

This in brief compass is the travel of Alexander. He took a little swing in Europe, passing through the Balkan mountains and down into the plains and across the Danube. With this as a preliminary, he returned to Greece and in 334 B.C. took up the old quarrel of his country with Persia when the great King Darius was threatening him from across the Hellespont. He won a victory and marched through Asia Minor into Syria. The next year he again defeated Darius and marched through Syria and rounded the eastern end of the Mediterranean and swung through Egypt. By 331 B.C. he had crossed the Euphrates and defeated Darius again. He entered Babylon and went to Susa. When he crossed the Pasitigris, he entered land that was unknown to the Greeks. In pursuit of Darius he then went northwest to the city of Ecbatana (Hamadan) and then to Rhagæ (Rayy). The forces of Darius were fleeing and demoralized and the King himself was murdered before Alexander could catch up to him near Damghan.

Now Alexander's immediate object was accomplished. He might have occupied any one of



ROUTE OF ALEXANDER THE GREAT AND OF NEARCHUS, 334-323 B.C.

(1) Asia Minor campaign. (2) Egyptian campaign (3) Babylon (4) Persepolis (5) Sogdiana. (6) Khyber Pass (7) Nearchus with fleet from Indus to Mesopotamia

the important and beautiful cities of Persia and commenced the expansion and consolidation of the empire. But this was not Alexander's style. He drove on through Astrabad, Tabaristan and Mazanderan. He was already beyond the wildest limits of the known world but he was still moving rapidly and, as he thought, founding cities as he went, naming them Alexandria. He planted towns in Bactria. He went to Meshed and touched the Murghab River and wintered near the modern city of Seistan. In the spring of 329 he made his way up the Tarnak. The army was weary and protesting but he led them none the less across lofty mountains where they froze and suffered from snow-blindness. He thought he was crossing the Caucasus but in fact he came down into the Kabul Valley. In the spring of the next year he crossed the Hindu Kush mountains and advanced to Balkh. From here he crossed the Oxus (Amu Darya) and finally reached Samarkand. When he reached the Jaxartes he felt sure he had reached the River Don.

He could not cross this stream at once but had to return to quell a revolt in his rear. When he did get across, he scattered the Turcoman tribes. Then he wintered on the banks of the Oxus. The spring of 327 he spent in random campaigning, shuttling back and forth through lofty and difficult territory. At one time he crossed the Hindu Kush by a pass 14,300 feet high. He sent one branch of his army through the Khyber Pass into India and he followed by another route. In the spring of 326, he came into the Punjab region in India. He fought along the borders of Kashmir and came near the modern city of Amritsar. Alexander heard of the Ganges and was ready to advance upon it. But the soiled and tattered army was staggering with fatigue. Alexander was now in fact well lost, he had been making rough surveys as he advanced, had planned his cities with some care and had intended to develop channels of trade; yet he thought the Indus was one of the sources of the Nile.

It was at this point that he put Nearchus in command of a fleet. He ordered him to sail down the river and find the sea. In 325 Alexander himself explored the Indus and sailed on the Indian Ocean. Then he sent Nearchus to sail back through the Persian Gulf. In the fall of that year he began a march westward, following the seacoast in an attempt to keep in touch with the fleet. He had an army of 12,000 and a great number of women and children and camp-followers. The march back carried him through difficult and waterless country. He was forced at several points to swing inland. Supplies ran out and many died before reaching fresh water. The guides failed him and he lost his way but finally came out near the Persian Gulf. In the spring of 324 he reached Persepolis and Susa. He planned to make Babylon his capital and he explored the Babylonian marshes. He planned to circumnavigate Arabia. In June of 323 he died at about 32 years of age.

Nearchus Sails Back from India, 325 b.c.

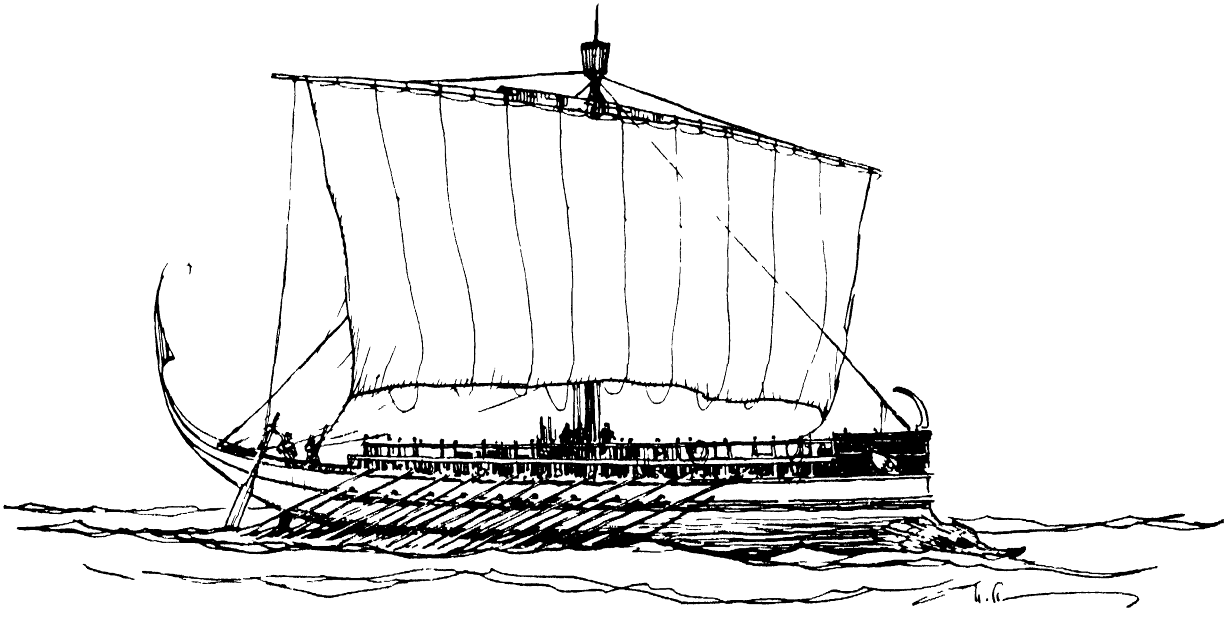
NEARCHUS is a by-product of Alexander's great marches through Asia. This does not mean that Nearchus is not a considerable explorer; it simply illustrates the scope of Alexander's plans and movements. In 325 b.c. Alexander is with a huge army in India on the River Indus. He says to Nearchus, "Open up a sea route from this river to the Euphrates. I march back by land, you sail by sea. You will have 150 ships and about 5,000 men. Sail westward. When you run out of provisions, come into the coast and the army will supply you, for I shall be marching through Baluchistan."

Alexander had the grand manner in giving orders, but Nearchus had to forage for most of his provisions and sometimes to go hungry. It was due to his efforts that the Mediterranean world first learned about a sea route to India.

The plan was that Nearchus was to wait for the northwest monsoon, but the East Indians made waiting inconveniently hot for him, so he started his great fleet in September, 325 b.c. The monsoon began changing while the fleet was off Crocola (Karachi), so there was a wait of twenty-four days. Then, after five days' sail, they came to a river, and later in a gale lost three ships, the crews of which were saved and distributed to other vessels. Somewhere near the modern city of Fourund, Nearchus landed and built a camp and established contact with an officer of Alexander, Leonnatus, who replenished the fleet's supplies.

But this was the only occasion supplies were renewed through the army. The rest of the cruise was a succession of hungry days at sea, broken by occasional raids and foraging parties ashore. Even after a successful raid supplies were scanty for so many men. They passed the island which is now called Astola and harbors a group of Zoroastrian sun-worshippers. But in those days the land was uninhabited. The local legend said that nobody lived on the island but mermaids and that any men who tried to land there never returned. Nearchus thought the legend untrue, or at least was willing to take a chance on the mermaids. He landed and, possibly to his disappointment, discovered that he was perfectly safe.

At last they finished with the barren coast and came in to Cape Jask and Carmania (Kerman). Here they found fertile ground and obtained grain and fresh vegetables. The fleet rested near Ormuz. Nearchus marched inland and found Alexander at Gulashkird. After this he joined the fleet again and explored the north side of the Persian Gulf to the mouth of the Euphrates. The fleet sailed up the Pasitigris to Susa and joined Alexander. The expedition lasted about six months.



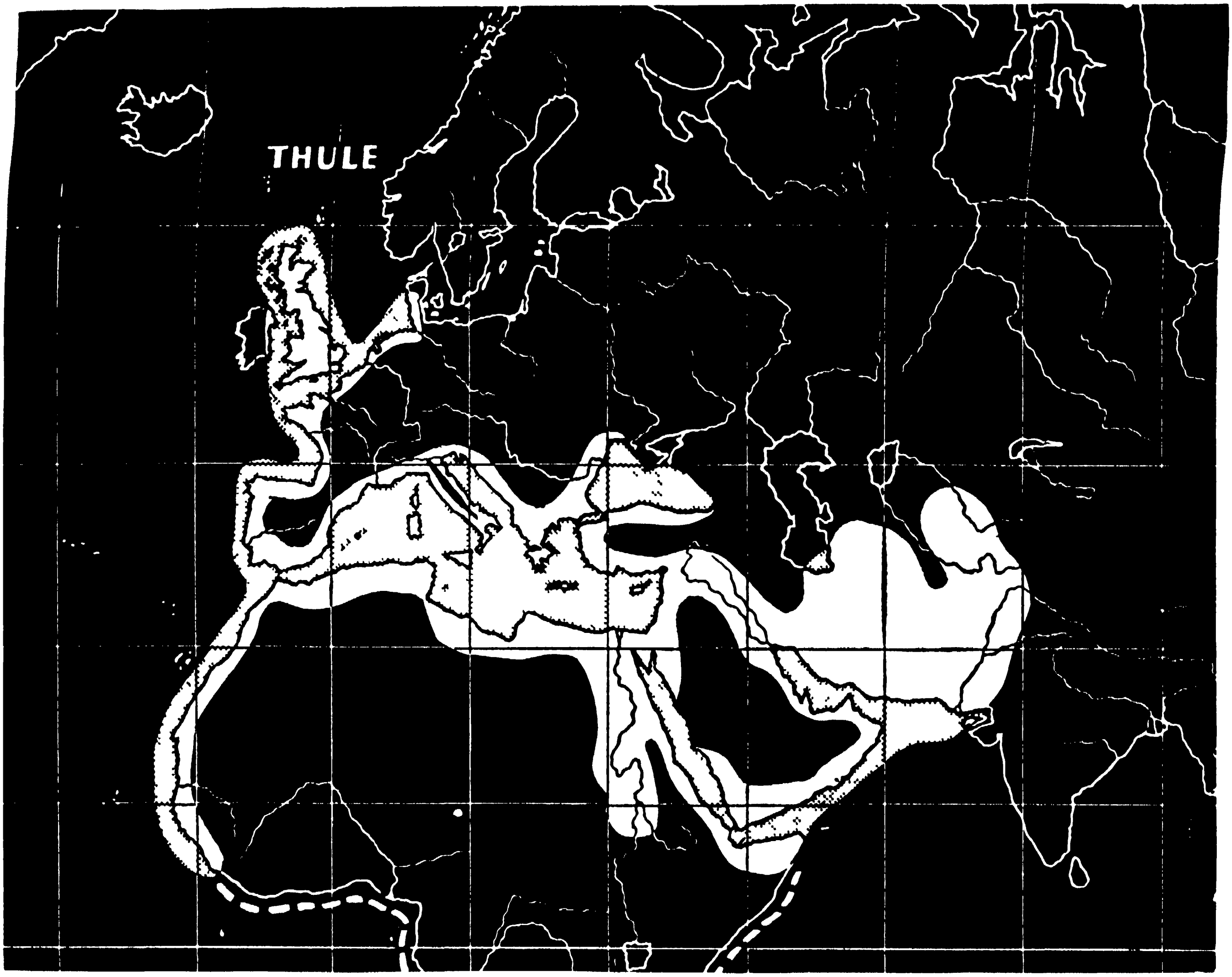
A GREEK BIREME

A long vessel for rowing or sailing with two banks of oars. In vessels generally similar to this the Greeks and Romans made war, and rulers and military leaders sped on distant errands. Adventurous navigators poked the decorative beaks of such ships into mysterious and unfrequented ports of the Atlantic coast of Europe.

This picture shows a characteristic classical ship. Larger vessels were built but the accounts of ships with many banks of oars are fanciful exaggerations or else we have a wrong understanding of what was meant by a bank of oars. As ordinarily understood, such ships would be mechanically impossible.

The Greeks and Romans also had a rounder-hulled, heavier-built cargo vessel. The cargo vessel depended more on its sails and the long war vessel more upon its oars. But sail and oar were used together on most Mediterranean vessels up to the time of the Renaissance. It was probably in the cargo vessel that most classic exploration to the east through the Red Sea to India was carried out. But Nearchus who sailed for Alexander probably had a fleet of long galleys. The vessel which Pytheas drove around England was probably also of this type, for Pytheas had to be ready to fight the Carthaginians or run from them. Antony sat on the raised forward deck of such a vessel when he sped from the battle of Actium to join Cleopatra.

The sail was used only for travel from place to place with favorable winds. It was lowered and the ships were maneuvered altogether with oars in a naval engagement. Note the decorative boar's head or rostrum at the bow used for ramming enemy vessels. Note also the eye painted on the bows, to protect the ship from dangers and to seek out the way. The Chinese had a similar superstition. They painted, and still paint, eyes on the bows of their junks. In European vessels this feature was later cut through and became the hawse hole, through which the anchor-cables pass. We still speak of the "eyes of the ship."



PYTHEAS EXPLORES WESTERN EUROPE AND SAILS AROUND ENGLAND (310 B C)

Pytheas Discovers England, 310 b.c.

ARE we to believe that history sorts out the works of men and recognizes merit? If so, the poor claimant for honors must wait a long time! Pytheas has had to wait 2,300 years to get his record straight. The early Greek historians thought Pytheas was telling tall stories, but modern students who have studied that record carefully see no reason for doubting his accomplishments.

He was not believed, because he was well ahead of his time; his work has even a modern air about it. Nowadays we are quite in the habit of recognizing that an explorer is also likely to be a scientist. But early explorers were mostly traders, adventurers or military leaders. Pytheas had a definite interest in scientific observation, though this probably was yoked also to a desire to break the Carthaginian monopoly on trade with the Atlantic coast.

For his time, Pytheas was a good astronomer. He had himself made the observation that the Polar star was not situated exactly at the celestial Pole. He had also calculated within several minutes the correct latitude of Massilia (Marseilles). *He brought back from the long exploration of northern Europe observations on tides and on latitudes. When he traveled into the interior of Great Britain, he made observations on the strange habits of the natives, and to this extent was one of our earliest field-anthropologists.*

As nearly as we can follow it, this was the course of Pytheas: He slipped out of the Mediterranean sometime when the Carthaginians had their backs turned. Cary thinks that this was probably in 310 B.C., when Carthage was fighting with Syracuse. Leaving Gades (Cadiz) in Spain, he followed up the coast to Cape Ortegal at the southern entrance of the Bay of Biscay. He crossed or skirted this bay and inspected the Breton coast and the island of Ushant. He crossed the Channel from Ushant to Land's End in Cornwall and established friendly relations with the tin miners. From here he made a complete circuit of the British coast, coming back again through the Channel to Land's End. He described Britain as being a triangle and gave rough measurements of each side. He considerably overestimated the size of the island, but had its general proportions correct. It is likely he supplied the geographer Eratosthenes with the information he used in locating Ireland with respect to Britain.

In Scotland, Pytheas heard of an island of Thule which was six days' sail north of Britain and was described in most unattractive terms. The name passes into literature as a symbol for an outpost of the known world, Ultima Thule. Some geographers believe that Thule referred to Iceland and others that it referred to a part of Norway. Though Norway hardly lies directly north of England its coast on short acquaintance might easily be mistaken for an island. The exact settlement of this problem is not very important, for Pytheas never visited either Iceland or Norway. But his remark is interesting, for it shows that even at this early date there was travel *by sea between northern Britain and some sub-arctic people.*

Sailing around Britain would have been a reasonable achievement for any navigator of those days, but Pytheas bettered this accomplishment by crossing the Channel again and following the European coast, as he says, "beyond the Rhine to Scythia and as far as the River Tanais." That is, he went as far as the River Elbe, and possibly as far as the River Don. He heard about an island rich in amber; this may refer to the island of Heligoland. Returning, he followed the European coast into the Mediterranean.

Pytheas's observations are often apt and reasonable. In Cornwall he observes how the tin ore lies in the ground and how the miners dig galleries through the earth-veins that separate the ore beds. How they smelt the ore and form it into ingots "like knuckle-bones." He observes that the miners are friendly, gentle and intelligent, and says that this is probably due to the fact that their trade brings them in contact with a number of foreign people.

On his excursions by land into England, he notes that the early Britons are a people sprung from the land, that they raise crops of grain and mostly live at peace with one another. The tops or ears of the grain only are gathered, and these are stored in underground silos. When they do fight, they wage war in chariots. Pytheas observes that this was the way the old Greeks are said to have made war about the plains of Troy. Julius Cæsar reported the same discovery in Britain over 250 years later.

This all sounds like reasonable and matter-of-fact observation; but in one case Pytheas seems to be romancing. He tells of a storm and of seeing waves over 60 cubits high. That is 90 feet! Naturally, the stay-at-home critics and the realists thought him a liar, for such things are not seen in the Mediterranean. But Cary points out that he may well have witnessed a storm about Pentland Firth. Here, in a great storm when the wind is bucking the tide, permanent solid waves are formed that are at least 60 feet in height and columns of spray are flung up several hundred feet above that.

The world is full of wonders, and Pytheas is only one of the many travelers who have been discredited for telling the truth.

DIOGENES THE GREEK TO EAST AFRICA (AFTER CLAUDIUS, 41-54 A.D.)

EXPLORATION in Central Africa was probably begun by a trader named Diogenes he Greek in the middle of the 1st century. He traded regularly with India and one time while coming home was blown past Cape Guardafui and ran for 25 days down the east coast of Africa along unknown shores.

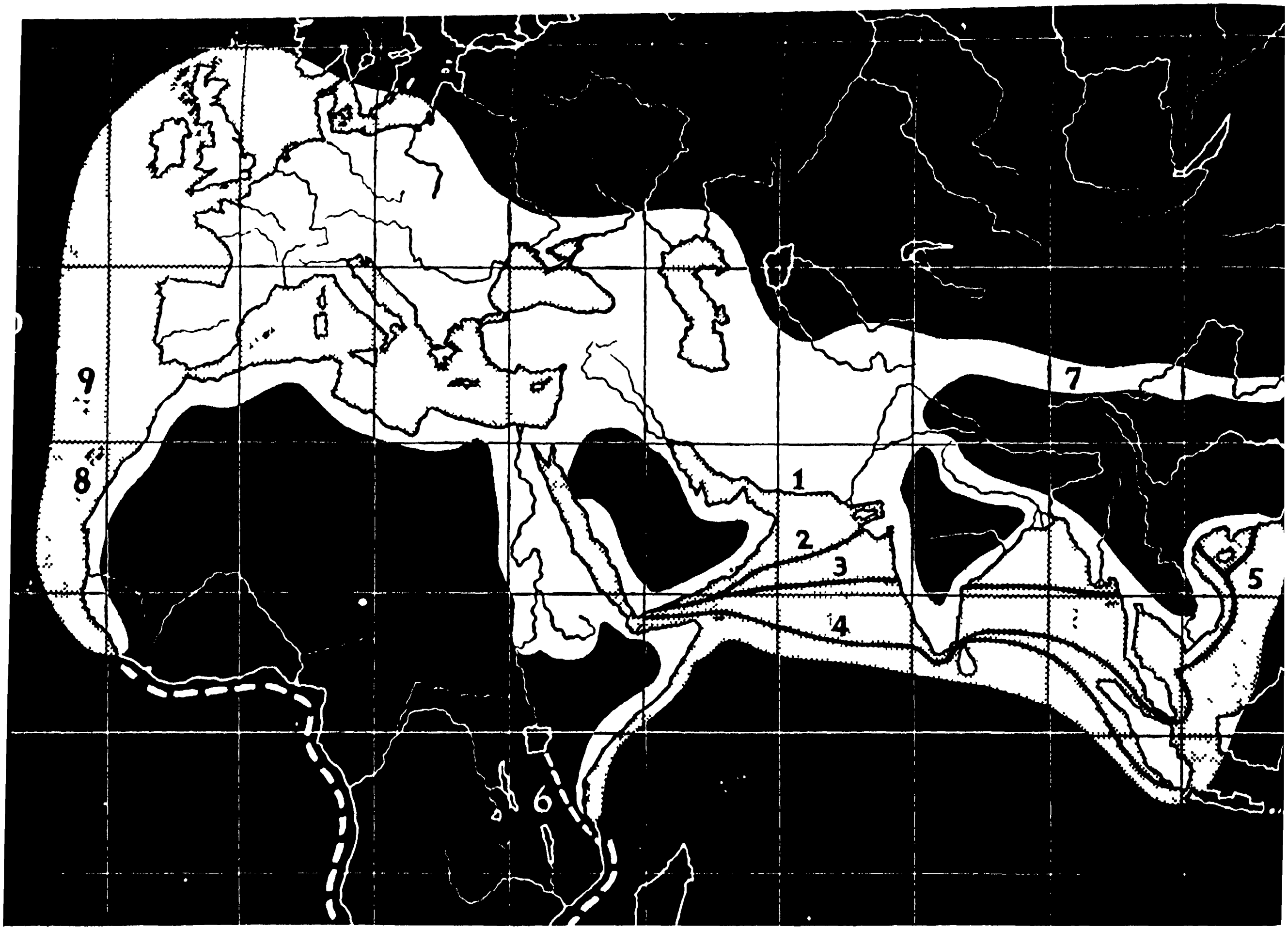
He succeeded in stopping his ship at Rhapta (Dar-es-Salaam). He said he made a trip into the interior and came to two great lakes and a range of snowy mountains. He said the snow on these mountains melted and ran into the lakes and streams from the lakes united to form the Nile. It is possible that Diogenes saw the mountains of Kilmanjaro and Kenya and that he reached Lake Victoria; it is possible, also, that he obtained his information from the natives. It is certain that he was on the east coast and that he brought back information which Ptolemy recorded in his history and the "Mountains of the Moon" and the lakes were drawn on the map from that time on. The question of the sources of the Nile became one of the great debates in geography and 1,700 years elapsed before the problem of the Nile was solved.

THE ANCIENTS AND THE MONSOONS

THE Greeks were the first Mediterranean sailors to encounter the monsoons and to earn to use them. The Persians had already been ailing to India. As early as 510 B.C., during the great expansion of Persian power, Scylax of Caryanda had explored the Indus River, had oasted westward, passing the Persian Gulf, ounding Arabia and coming to Egypt near Suez. He had thus sailed from the limit of Persian power in the east to the shore of its westernmost province. But Scylax coasted all the way and eems to have taken little advantage of the seaonal winds. For this reason the trip took him a year and a half. It was Nearchus, who sailed Alexander's fleet, who was the first European seaman to learn to use the monsoon in the right way.

The monsoons are steady seasonal winds that sweep across the Bay of Bengal, the Indian peninsula and the Indian Ocean. The winds change their direction with the season, blowing from the ocean to the land during the summer months when heated air is rising from the hot earth and blowing from the land to sea in the winter when the earth has cooled rapidly and the sea is still warm. In the Indian Ocean, which lies between Arabia, the east coast of Africa and India, the monsoons blow from the southwest in summer and from northeast in winter. The southwest monsoon of the warm months in India comes off the sea laden with great moisture which forms the seasonal rains.

Nearchus was forced by hostilities to make a false start but then he had sense enough to wait



THE ANCIENTS AND THE EASTERN SEAS

(1) Coast—Nearchus (2) Hippalus (3) Second Route (4) Final Monsoon Route (5) Alexander the Trader (6) Diogenes the Greek—to Victoria Nyanza (7) Silk trade by land to China (8) Juba—to the Canaries (9) Madeira ( ) (10) Azores ( )

25 days until the season changed and the winds were with him. He then made his westward passage under proper conditions and in much less time than Scylax. It was Hippalus, however, who first had confidence enough in the monsoon to sail his ship across the sea instead of following the shore.

He did this about the beginning of the Christian era. Hippalus observed that the Indian peninsula thrust southward into the sea and he had a more or less clear idea of the true relationship of India to Cape Guardafui and the Arabian coast. If he could, he had good reason for avoiding the Arabian seaports and the Persian and Baluchistan coasts, for these were hostile to Greek trade, exacted a heavy tribute and were beset by pirates. Sailing out of the Red Sea, therefore, Hippalus followed the Arabian coast for only a short distance and then, plunging into the blue with the southeast monsoon, sailed directly for ports in the district of Kutch in India. Other Greek traders soon followed him, using his course and sailing at the same season of the year. He became well known and highly esteemed for his discovery, and places in the Indian Ocean were named after him.

It is difficult to make a good landfall on the coast near Kutch. It is low and sandy and beset with dangerous tides and river currents. Besides this, the wealthier cities of India were to be found farther south on the Malabar and Coromandel coasts. It was these that produced the scents and spices and jewels that were so sought for the Roman luxury trade.

Therefore about 50 B.C. some nameless Greek merchant, for the Romans left trade in the hands of the Greeks and the Levantines, boldly modified Hippalus's course. Still utilizing the monsoons, he sailed directly from near Cape Guardafui to southern India and even to Ceylon, which was then known by the name Taprobane. This course also became a regularized line of travel and guide books were written during the 1st century describing the full route from Italy and Greece to India. At least one of these books has survived. Embassies and trading commissions were exchanged between the Roman court and those of the Indian princes.

The final step in the use of the monsoons came about the year 100 A.D. in the time of the emperor Hadrian. And this step was taken by a Roman trader named Alexander. Following the same line of thought that had led Hippalus across the Arabian Sea, Alexander developed the trade passage across the Bay of Bengal. Alexander was followed by other traders, but apparently he pushed his voyages farther than others dared. He crossed the Gulf of Siam, touching in Cambodia, and then went on to a spot which he calls Cattigaro; this is identified as being Hanoi in Cochin-China. Certainly he established trade with Chinese merchants and a Roman coin has been found in Hanoi. This marks the final extension of classical trade and influence.

THE ANCIENTS AND THE ISLANDS

IT seems doubtful if the ancient seamen really ever ventured out into the Atlantic.

There is a story that Phœnician coins were found on one of the Azores but this is a very dubious matter, indeed. There is the story also of Himilco (500 B.C.), the Phœnician, who is supposed to have sailed to sea and to have come to islands where his ship was entangled in seaweed and where great sea serpents swam in the waters. Some have argued that he came to the Azores and others that he reached Ireland. No definite identification is possible.

The name Sertorius (80 B.C.) crops up occasionally. In fact, he was never an explorer himelf but reported an interesting occurrence. He was a Roman exile at Gades (Cadiz) in Spain when a group of sailors brought home a ship saying that they had found the "Fortunate Isles" in the western sea. These were two islands 10,000 stades (that is about 1,000 miles) from Africa. The islands were sheltered from the north and east winds but received breezes from the west and south. From these latter directions the winds brought gentle rain and the ground was fertile. This description of the climate sounds very characteristic of Madeira and there are two main islands in the Madeira group. But the distance given would be about right for the Azores. Again we are left in doubt, for, though Sertorius wrote delightfully about the "Fortunate Isles," he never went to look at them and confirm the story.

Juba (25 B.C.-25 A.D.) was by birth a Numidian, the son of a king of that country who bore the same name. The elder Juba was defeated by the Romans in 46 B.C. and committed suicide. The son, who concerns us here, was taken to Rome by Julius Cæsar and there educated. Octavius, that is Augustus Cæsar, gave him back his father's kingdom. Juba also had the distinction of marrying Cleopatra Selene, daughter of Cleopatra and Antony. When Numidia was made a Roman province, Juba was made king of Mauretania (Morocco).

While king of Morocco, Juba promoted an expedition which sailed to the Canaries and brought back a good description of six or seven islands of that group. The nut trees and palms of Grand Canaria were described and there was a description also of the "Banner Cloud," which condenses on the leeward side of Pico de Tyede, the high volcanic peak of Teneriffe.

The expedition found dogs, goats and lizards on the island. They said also that there were signs of previous habitation but no men were found. Juba never colonized the islands but he described them in a book which he wrote about African geography. He also wrote books on philology and African history and on the history of painting, but these are lost.

Between the time when Juba's expedition visited the islands and when the Portuguese rediscovered them, the savage Guanches, a division of the Berber people, had crossed over from Africa and settled there. The Canaries became known as the "Fortunate Isles," though Sertorius had used the name for the group he had compounded out of the sailors' description of Madeira and his own imagination.

A Note on Ancient Navigation

THOUGH the Greek and Roman and other early explorers were very daring, they were not deep-sea sailors. Today we should regard their expeditions as coasting voyages, and this is in fact what they were. Even on their longest runs the ships were feeling their way from one landmark to another. What bound them to the shore was not a lack of courage but of technical skill.

What limited the early voyages was not the size of the vessels. It is apparent from all marine history that the question of size is negligible as compared with the questions of design and handling. It has been demonstrated many times that a small ship, properly designed, has no great difficulty in bad weather or on long passages. But nearly all the early Mediterranean vessels ran to a bowl-like form which must have made them uncomfortable and almost unmanageable in a strong swell or in rough weather. There is still a general belief among the inexperienced that a relatively broad vessel will be steady in rough weather whereas a narrow vessel will roll easily. Quite the reverse, of course, may be the case. A rather narrow, deep vessel, properly ballasted, maintains a relatively horizontal deck, letting a wave, for the most part, slide over it, under it or by it. A broad vessel, however, is more on the surface; it must, therefore, be involved in more of the slope of each wave that passes, and consequently will be more subject to rolling motion.

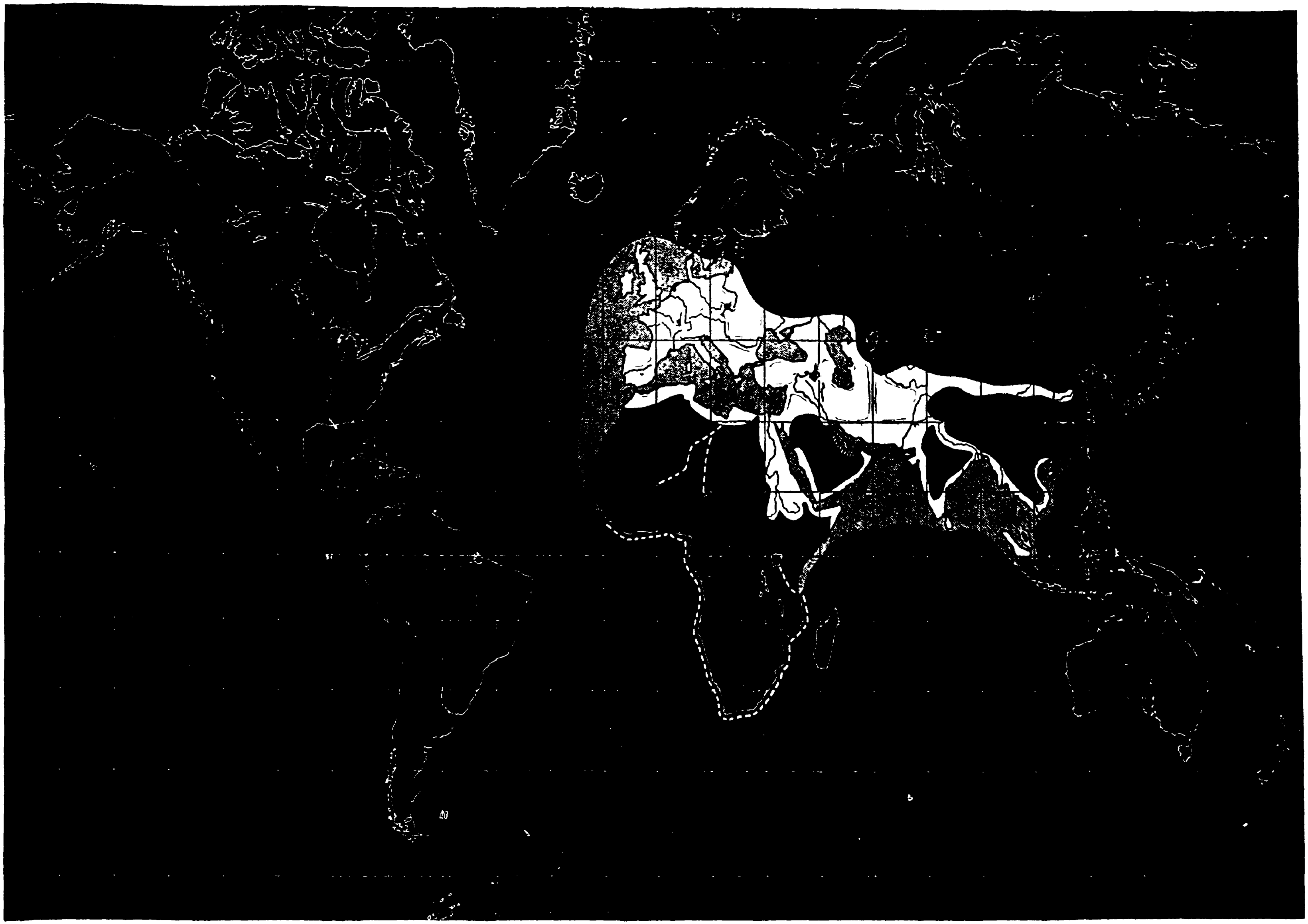
Of course, we can only guess from the look of a vessel how she is likely to behave and what her sailing qualities are likely to be. My guess is that the classic vessels were uncomfortable in a sea way, were unhandy and difficult to steer, could make no progress to windward, and, owing to their lack of keel, their high freeboard and their inflexible sail equipment, became virtually unmanageable in severe weather.

Another point of the greatest importance which we must bear in mind is that few if any of the earlier vessels made proper provisions for the officers, passengers, and crew. There was little if any properly decked space in these vessels—almost no provision for sleeping arrangements and very limited stowage for food and gear. So far as we can judge from the early accounts, all ships were overcrowded. All these factors, of course, imposed limits on the length of the voyage that could be undertaken in the ships.

One of the greatest limitations, however, was the ignorance of navigation. The Greeks had among their numbers some very good astronomers and geographers, but they never succeeded in making much practical use of their knowledge of the heavens and the structure of the earth. They had concepts of latitude and longitude, but these were not used in navigation, for they had no practical methods of determining either. The Greeks ashore had some understanding of magnetism, but they had not developed the compass. They had a rough instrument consisting simply of a circle or of a hollow bowl and a pointer casting a shadow. This instrument was used in determining the altitude of the sun or other celestial bodies, and so making a rough estimate of latitude. But their methods of measuring time at sea were virtually nonexistent, and were poor enough ashore. For the most part they depended on sundials, which were useless at night or in cloudy weather, and particularly useless on a moving vessel. In classic times they had devised clepsydræ, or water clocks, but these seem to have been rare and to have been impractical, or at least not used, on vessels.

Navigation, therefore, in our sense of the term, was virtually nonexistent. The early shipmasters depended on a knowledge of the prevailing winds in their part of the world for their guidance; they depended particularly on a knowledge of landmarks along the seacoast and a set of empirical rules for setting the course. These rules had been built up by trial and error over considerable periods of time.

The Mediterranean, as almost everybody who has sailed on it or lived on it knows, can become a violent and uncontrollable body of water. Its sudden storms and sharp winds are well known. Fortunately, however, the worst of the Mediterranean gales are confined to the winter months, and in spring, fall and a large part of the summer there are considerable periods of clear and settled weather. Most of the early voyages were consequently made in these months, when winds were relatively steady and followed each other in an order that became familiar to the voyagers. The regularity of winds in various Mediterranean areas gave rise to the fact that the winds had definite names and that these names were used also for giving directions and setting courses. This seems a little odd to us who have reversed this process by giving names first to our points of the compass and then naming the winds according to the direction from which they blow.



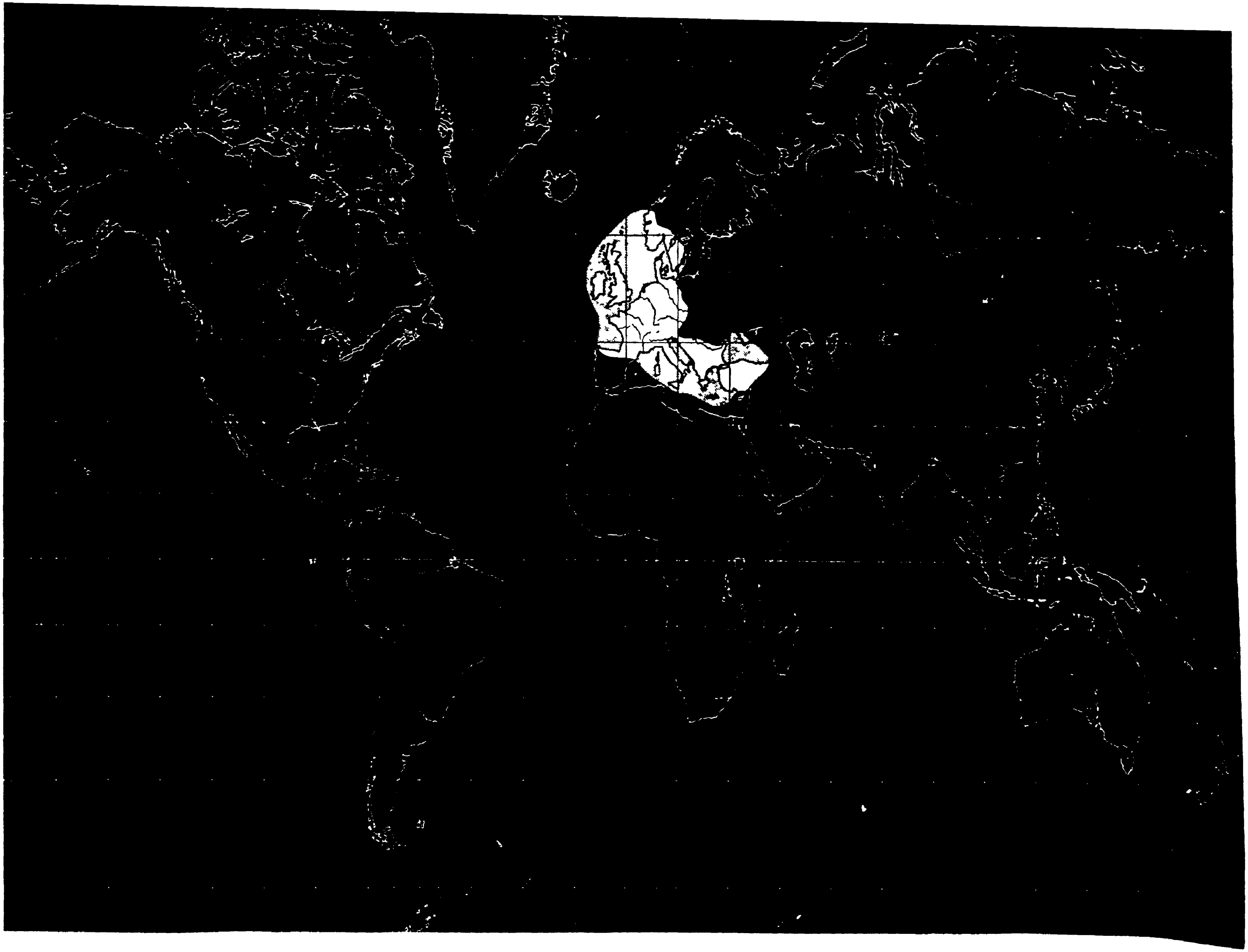
THE WORLD AT THE END OF THE CLASSIC PERIOD

Time of Ptolemy—150 A.D.
The long line reaching into China represents the over-land route followed by the silk trade.
After Cary & Warmington.

PART II

THE DEATH AND REBIRTH OF ADVENTURE

The Middle Ages



LIMITS OF THE CHRISTIAN WORLD, 800 A.D.—ABOUT THE TIME OF CHARLEMAGNE THE GREAT

THE DEATH AND REBIRTH OF ADVENTURE

The Middle Ages

IN this book we are putting together the story of exploration and discovery. It is not our business to review political and cultural history. Yet the welfare of a country and its will to explore seem to be closely related. The energy, the inquiring mind, the courage for endurance that find expression in exploration, may well turn out to be in themselves one of the important measures of a country's greatness. It would be an interesting question to ask whether it was the travel and adventure that enriched and stimulated the national life or some sudden outburst of energy at the heart of a nation that sent men afield. However we may answer this question it seems clear that at least in the western world exploration flourishes with the arts, sciences and philosophies as though it were an integral part of them and it dies when they die.

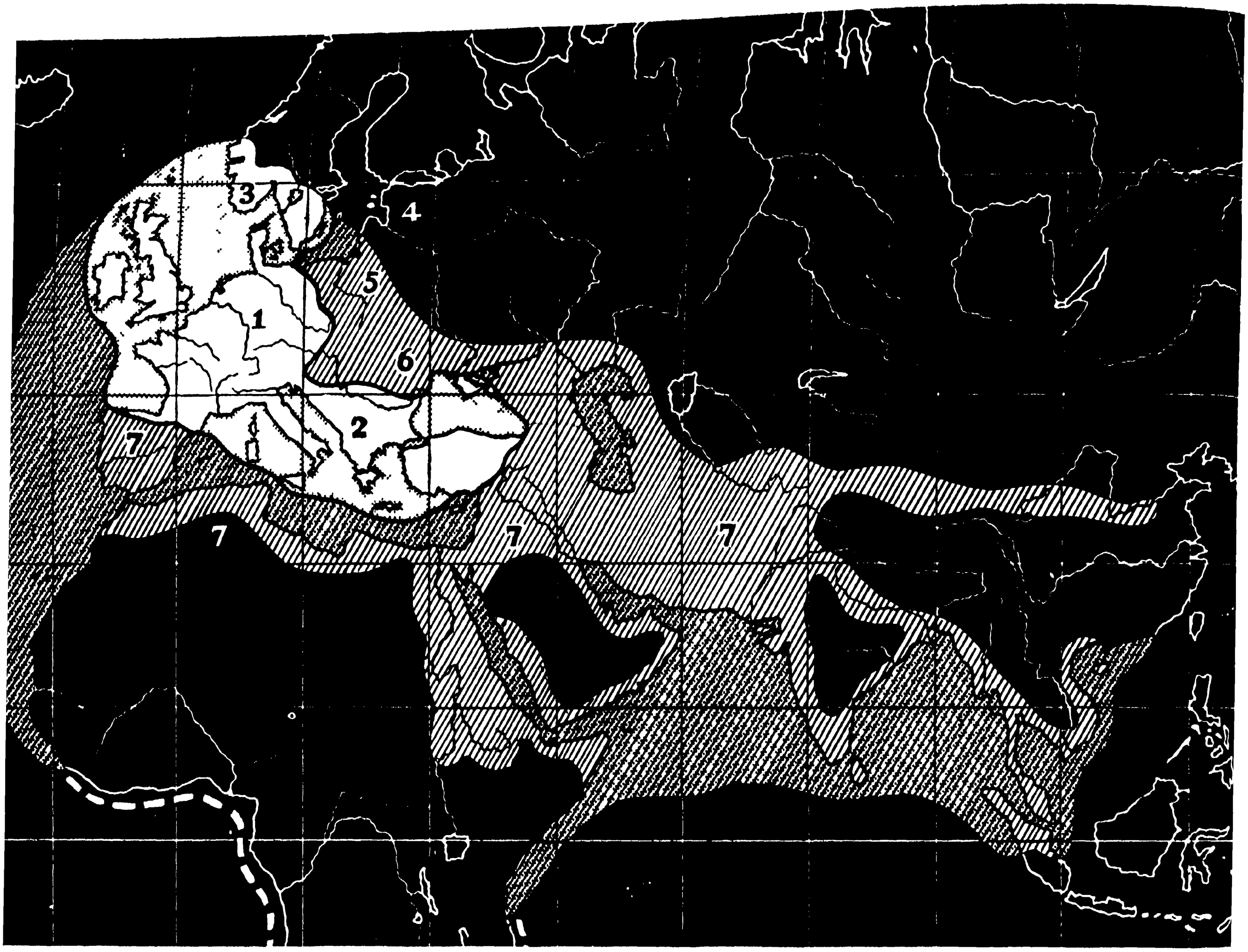
For this reason we must remind ourselves what happened when the ancient empires and the classic cultures that had spread about the Mediterranean crumbled and the Gothic woe crept over Europe. The Roman Empire came to its melancholy close. We probably still speak of the fall of the Roman Empire because Gibbon used this phrase. Yet it did not fall as a tower or wall of a great city might fall; it seemed rather to slip into a weakness like that of an old man who is distraught by fever or beset by enemies. The Northern Hordes attacked it from without and the growing number of the Christian converts weakened and altered its internal structure.

Exploration ceased. There was no progress in geographic knowledge; indeed, progress reversed itself. Commerce shrank, exploration and adventure ceased while men pursued theology and alternately exhorted and attacked their neighbors and next of kin. Dry at the root, the Empire drew in upon itself like a withered flower, armies were recalled, provinces and colonies were lopped off or left to strike new roots for themselves. Faith became the issue and knowledge was disregarded. What was left of knowledge and science finally found shelter in the half-light of the monastery and the cloister. In geography Aristotle and Ptolemy embodied all that was known, and gradually their teachings became displaced or perverted. For Rome and for the rest of Europe, the idea of a globular world which the Greek astronomers had contemplated collapsed like a pricked balloon. The earth became a flat disk; it remained a flat disk for a thousand years.

Yet the very influences that shattered Rome—the barbarian invasions and the growth of the Christian church—had in them elements which eventually brought men in contact again with a larger world and which stirred them to undertake new travels.

THE NORTHERN HORDES

FROM the north and the east the barbarians poured into Italy, France and the colonies. The Goths came in 378, the Visigoths in 395, and in the same year the Huns came by way of Asia Minor. In 406, the Vandals crossed the Rhine into Gaul, making their way through Spain into



EUROPE IN THE DARK AGES

(1) Kingdom of the Franks (2) Byzantine (East Roman) Empire (3) The Norse Swedes and Danes. (4) Finnish People (5) Slavic People (6) Avars and Magyars (7) Califate Islamic

North Africa and then coming around to attack Rome through Sicily and the islands. Wave after wave these barbarians swept into southern Europe.

In a vague and terrifying way they imposed a knowledge of a strange and far-flung world to the north and east. They now made real the places and the people that had never been more than flourishes in a traveler's story. But the knowledge that they brought was not an experience that the Latin mind could encompass; hostility and terror in themselves froze understanding and the invaders had little enough to communicate. Still, when the invaders had either been driven back or absorbed, Europe was left conscious of an eastern and northern frontier, and of strange, uncouth and terrifying people that dwelt beyond it. For centuries that ragged and dangerous frontier existed to trouble the peace of Europe. Under the impact of the Huns and Goths, the Mongols and the Turks, that frontier was always wavering and occasionally broken. It was the desire of the Pope to establish contact with the great Khan of the savage Mongols that sent out Carpini and Rubruck, the first European voyagers into Asia.

THE Norsemen did not sail to America in one bold trans-Atlantic passage. They advanced by stages from one North Atlantic island to another. By the middle of the 9th century they had an established colony on the Faroe Islands. In the year 867, one of the colonists sailing to the Faroes was swept out of his course by a series of storms. Suddenly in the bleak North Sea he came upon a shore line and inland saw mountains covered with snow. He named the place "Snowland" and sailed home to report his discovery. Three years later in 870 a Norse expedition followed up this colonist's discovery. They proved that this "Snowland" was really an island and spent the whole winter season there and rechristened it Iceland. Four years later, that is in 875, Iceland was definitely colonized and settled. There is evidence that Irish Christian monks had sailed to Iceland as early as 795 but this is by no means certain.

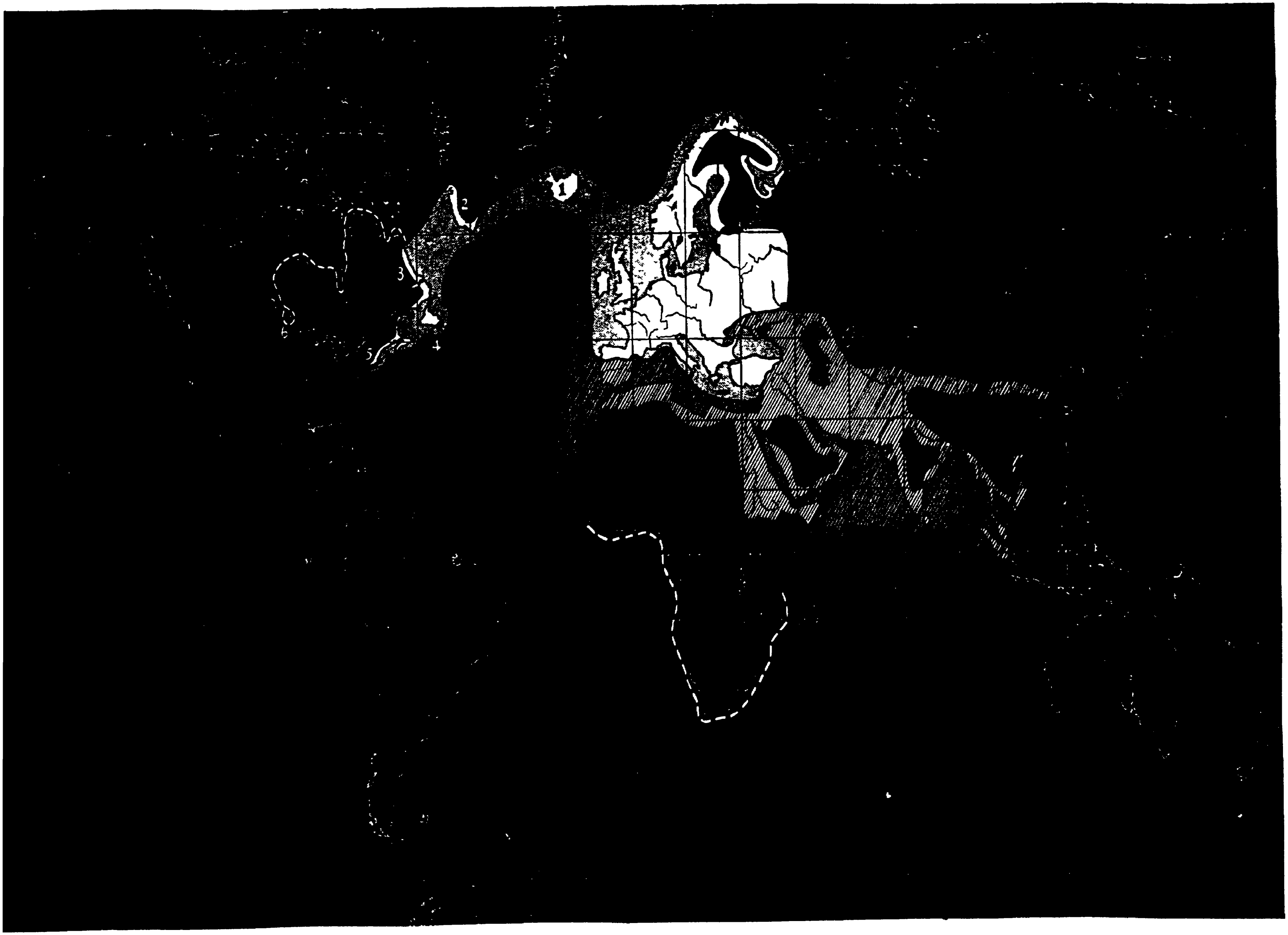
With Iceland colonized and with a route there fairly established, Eric the Red in 982 pushed on to Greenland and this also was colonized. It was probably Bjarni in 986 who first reached the American continent. The parts of the coast which he sighted probably included Cape Cod, Nova Scotia and a part of Newfoundland.

Following Bjarni, Leif Ericson (a son of Eric the Red) reached America in 1002. He separated and named three parts of the country: Helluland (land of the flat stone); Markland (woodland); and Vineland or Wineland. These are thought to represent: the first, part of Labrador and Newfoundland; the second, Nova Scotia; and the third, New England probably at Cape Cod. In 1004 Thorvald came, and in 1024 Karlsefni stayed for a considerable time on the continent. He spent three seasons here, and probably made his headquarters at the western end of Long Island.

It is almost certain that the Norse came this far and recent scholars have come to believe that Karlsefni and his comrades may have sailed as far as the coast of North Carolina. It is not possible to decide the exact points which the Norsemen reached for the descriptions they give are generalized and rather brief. Also certain features of the American coast repeat themselves several times between Newfoundland and North Carolina. Spots would be particularly hard to describe when the coast was wooded and before man established any landmarks here. It is clear, however, that the Norse descriptions conform in a general way to the climate, the harbors and the topography of the American coast.

There is evidence of a still greater voyage and a more remarkable drama enacted by Norse voyagers in America. In 1898 a Swedish immigrant named Olof Ohman was clearing up stumps in a wood lot near Kensington, Minnesota, when he pulled up the stump of one aspen whose roots were growing right around a rough-hewn stone. He saw there was writing on the stone, but could make nothing of it. When the stone was finally cleaned up and studied this was the translation of the runic characters offered by Mr. Hjalmar Holand:

1. (We are) 8 Goths (Swedes) and 22 Norwegians on
2. (an) exploration-journey from
3. Vinland over the West (*i.e.*, through the western regions) We
4. had camp by 2 skerries (*i.e.*, by a lake wherein are two skerries) one
5. days-journey north from this stone
6. We were (out) and fished one day After



THE WORLD ABOUT 1000: THE NORSE TO AMERICA

(1) Iceland (867). (2) Greenland (982). (3) Helluland (986-1024). (4) Markland (986-1024). (5) Vineland (986-1024). (6) The Norse to Minnesota, 1355-1362 (the Kensington Stone).

7. We came home (we) found 10 (of our) men red
8. with blood and dead Ave Maria
9. Save (us) from evil

(The following three lines appear on the edge of the stone)

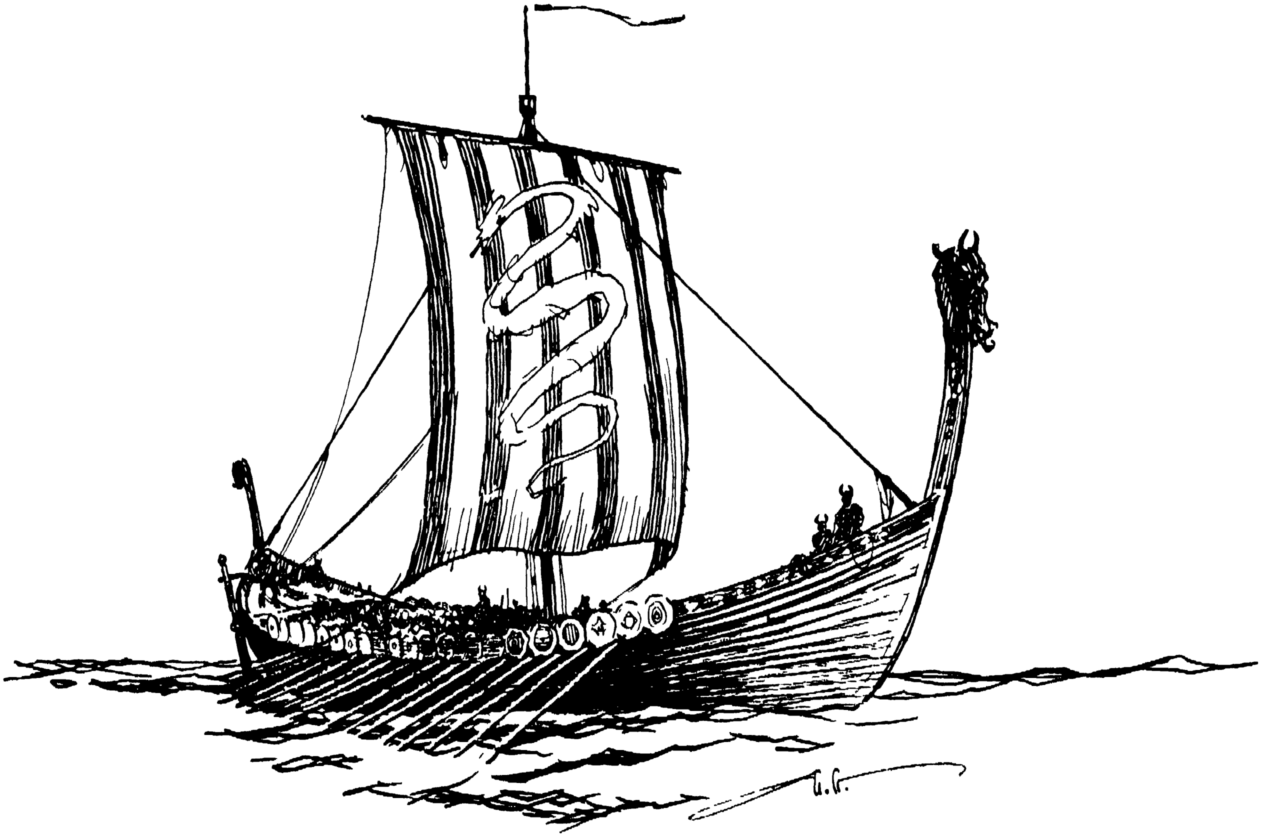
10. (we) have 10 of our party by the sea to look
11. after our ships (or ship) 14 days-journey
12. from this island Year 1362.

However Professor Breda of the University of Minnesota was the first to read the stone. He pronounced it a modern and rather clumsy fake. There was a little talk about it and then it was forgotten. For nine years it lay neglected in Ohman's barnyard serving as a doorstep to a farm building. Fortunately it lay face down. At the end of this time Mr. Holand came across the stone, borrowed it, made his own translation and commenced a careful study of it as a historic document. This study has occupied him from that day to this and has given him plenty of trouble.

But Mr. Holand has stuck resolutely to his defense of the genuineness of the stone and has won many arguments, point by point, against the professional skeptics. Forestry experts have testified that the aspen tree must have been 70 years old at the time the tree was grubbed up. The stone, therefore, could not have been inscribed before 1830 and no one at that time in that region could have had knowledge or interest in creating a forgery. Three geologists have studied the weathering of the inscription of the stone and have pronounced it very old. Mr. Holand has devoted himself to history and linguistics. The language is certainly a difficulty for it does not correspond exactly with the best Norse of the time nor exactly with any known dialect. But Mr. Holand points out with some reason that the party was made up of Goths and of Norsemen, that they had been living together for many years and that they probably influenced each other and employed a dialect of their own which all could understand. They were probably not learned men even for their own time.

The historic case is a good one and runs like this. Vineland and Markland were not episodes in the travel of the Norsemen. The settlement in Greenland hung on for some time and the settlers came to the American coast for timber. They became associated with the American Indians, intermarried and gradually fell away from Christianity. It is clearly established that King Magnus Erikson in 1355 sent a missionary expedition to Greenland to redeem this colony. This expedition finding the Greenland colony moved to the American continent crossed to the mouth of the St. Lawrence. Still looking for their countrymen, they followed the shore line northward through Davis Strait into Hudson Bay, around its shore to the mouth of the Nelson River. Here they left their ship and part of their company traveled up the river through the Lake of The Woods and so up the Red River to the neighborhood of Kensington. Here they left the stone in memory of their massacred comrades and to mark the extent of their journey.

Mr. Holand has not yet proved all of his points but his book published in 1933 presents a very strong case for the authenticity of this remarkable voyage.



THE VIKING SHIP

WE know very well what the Viking ship looked like, how she was built and how she was managed. The long ships were called "Serpents." Several examples of Nordic vessels of early times have been buried in Norway and later dug up and reconstructed. One of these is the Gokstad ship now in the museum of Oslo, Norway. This ship dates from the 10th century, but we know from other drawings and relics that the general style of the vessel differed little for hundreds of years before and after this date. It is on the Gokstad ship that the present drawing is based. It was in such a vessel that Eric the Red and Leif and Karlsefni made their voyages.

This ship is primarily a rowing vessel. The beautiful easy lines of the hull show that she was designed to be driven. The sail-plan is the simplest possible and could be used only with favoring winds. The ship is open throughout save for the small raised platform on deck in the extreme bow and stern. The mast was set in such a way that it could be taken down in severe weather or at night, when it was set up in props and served as a ridge-pole for the sail or some other piece of canvas draped over it to form a tent. This was the only protection against weather which this ship supplied.

Note the use of the rudder-paddle mounted at the quarter on the right side of the vessel. Thus this side was known among the Nordic peoples as the steer-board, or as we would say, starboard side of the ship. Standing at the tiller the helmsman faced this side; the other side of the vessel became therefore the boekboard, or backboard; in French, baboard; and in English, larboard side of the ship. In approaching a landing with this ship the rudder would preferably be kept on the off-shore or deep-water side of the ship. It is likely therefore that this feature would account also for our other name for the left side of the vessel, that is, the "port" or shoreward side.

When a Viking king died he was buried in his ship.

THE CRUSADES, 1096-1272

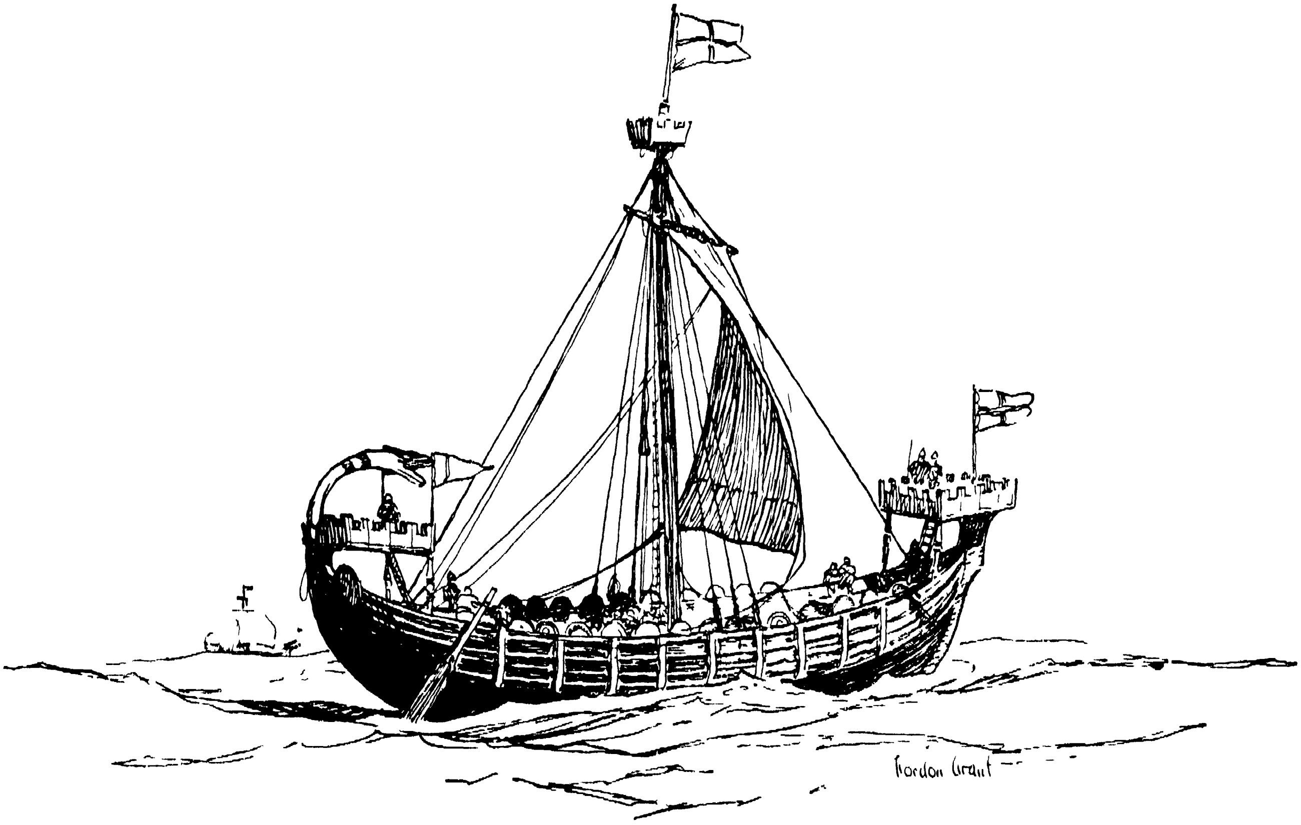
FOR many centuries Europe kept to itself, seldom looking beyond its own confines. Even about itself the geographic knowledge of Europe was limited. The division of Europe into small principalities, the bad roads, the growth of the feudal system, the quarrels of the lords and of the clergy, the power of the Church growing at the expense of the power of the State—these concentrated men's minds on local issues. But there came also a time when the growth of Christianity provided a kind of emotional unity. Pope Urban had encouraged this unity of feeling, and began preaching a crusade against the infidels. From Constantinople the Emperor Alexius cried for help. Thus aroused, men looked about and saw that the Turks threatened Constantinople and wielded great power in the East. They saw also that the Arabs held the Holy Land, and that Islam had swept through North Africa and invaded Spain and Portugal in the West.

Then the Crusades began. Their object was to recapture Jerusalem and loosen the hold of the Saracens on these other territories. All manner of people made up the crusading hosts. There were among the leaders and followers devout Christians, but there were also knight adventurers, traders and get-rich-quick men, rogues of all sorts and all the usual hangers-on of an army. Before a properly organized Crusade could assemble, popular but irresponsible orators, such as Peter the Hermit and Walter the Penniless, gathered 60,000 of both sexes in Lorraine and France. This was in the spring of 1096. They started off, passing successively through Germany, Bavaria, Hungary and Bulgaria, rolling up recruits as they moved along until they had 300,000 followers. It was a disorganized mob on the march, foraging over the land, driven on by fanatical and untrained leaders. As they progressed eastward and southward, they encountered increasing hostility. They were scattered by the enraged Bulgarians, and about 7,000 who were reassembled by Peter the Hermit reached Constantinople. Constantinople did not want them and Alexius passed them on to Asia Minor. Here they attempted to defend a fortress but were attacked by the Turks and many were slaughtered. A second division of the Crusade from Germany was massacred by the Hungarians.

The first official Crusade was a more orderly affair, but again a French enterprise at its inception. This Crusade enlisted the leadership of the nobility and had the support of the bishops. It was a complex affair and moved in five main divisions and by different routes eastward and southward. They reached Syria and by the spring of 1098 they had taken Antioch. By July of 1099 they had captured Jerusalem. Hardly were they established in the East before hostility between the factions at Antioch and the factions at Jerusalem developed.

The Second Crusade was preached by St. Bernard and, with sections from both France and Germany, attacked Damascus in 1148. This ended in failure. But in 1147, Alphonso I, aided by a group of English, French and German crusaders, captured Lisbon. They thus helped in reclaiming Portugal from the Moors and in reestablishing its independence.

It is unnecessary to trace the history of the Crusades in full. There were many and they varied in character and in purpose from the very important and highly organized Third Crusade



THE MEDIEVAL SHIP

OUR drawing shows the characteristic ship of the later Middle Ages. To be more exact, this is a ship of the north European ports at about the time of the Crusades. It was in a fleet of vessels something similar to this that Richard the Lion-hearted sailed for Europe and the Holy Land. It is true that we have accounts of larger vessels such as could carry a captain, 15 sailors, 40 knights with their horses, 40 men-of-arms, servants and stores. But the larger ships were exceptions and our example is the characteristic type which probably changed little over a period of many years.

No exact plans and no remains of medieval ships exist. Our knowledge of this type comes from tapestries, a few old drawings and the seals of the ports of the English and French coast. Cæsar gave us our first description of the vessels of the Atlantic coast. These were the ships of the Veneti of Brittany. These vessels were round and bowl-like, with shallow draft and rather flat bottoms so that they might be drawn up on beaches. They had a marked sheer, that is they swept upward at the bow and stern. They were built of unusually heavy timbers and planking; they depended upon sail and not upon oars. See how all these characteristics are adapted to the heavy weather and rough seas of the Atlantic. The ships made an impression upon Cæsar because they contrasted with the lower, leaner, lighter galleys of the Mediterranean waters.

The medieval vessel preserved many of the characteristics of the ship of the Veneti. In the earliest ships the curious, raised structures that we see at the bow and stern were not permanent. These ships were mostly cargo and transport vessels. The European nations then had no Royal Navies. When war threatened, the merchant ships were taken over and these structures were erected on them and they became Naval vessels. The two raised platforms became the stations of the fighting men, the space under them served as shelter. Later they became part of the permanent structure of ships. They were known as the after-castle or summer castle and the forecastle. It is from the latter word that we derive our modern "fo'c'sle."

to incidents as ridiculous and as tragic as the Children's Crusade.

Legends have gathered about the Children's Crusade. Many statements can no longer be accepted as fact, such as that French children on a crusade were embarked at Marseilles to the number of 30,000 on the ships of pirates and subsequently sold into slavery in Alexandria and Bugia. The true events which lie back of the later exaggerated stories of the Children's Crusade are themselves sufficiently strange and interesting. They illustrate the queer excitements that ran their illogical courses in the medieval world and the power with which the crusading idea had gripped men's minds. From reasonably reliable contemporary accounts, it seems that there were two movements of children. In France, a boy by the name of Stephen from Vendôme, who believed himself inspired, gathered about him boys and girls and some older persons from many cities and towns. One chronicle said there were 30,000 of them and they marched in a territory between Paris, Calais, Laon and Rouen. They marched with crosses and sang and said they were going "to God"; but there is no evidence that they really started on a crusade or pilgrimage. They seem finally to have dispersed and gone home.

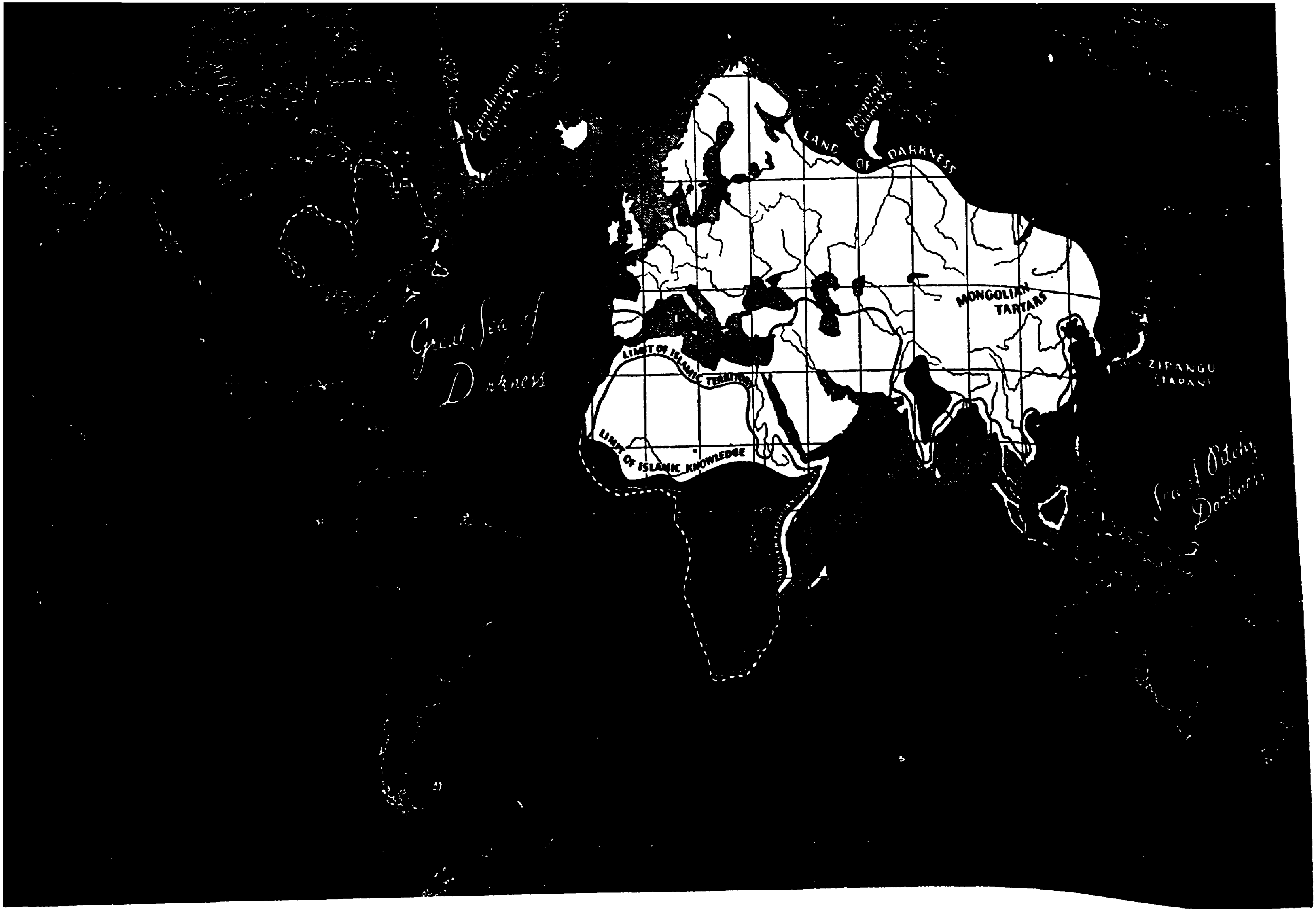
At the same time in Germany, a similar boy-leader, Nicholas from Cologne, also gathered about him boys and girls and men and women. It seems some of the adults who marched with the youths and damsels were not inspired by wholly religious thoughts. Many bands assembled and later united in one group, marched up the Rhine, over the Alps and into Italy. This really had the intent, if not the character, of a crusade or pilgrimage. Parts of this company made a real effort to embark for the Holy Land, some going to Marseilles and others to ports in Italy. The Bishop of Brindisi, suspecting trouble, prevented some from sailing from his city. The company broke up in various parts of Italy and many of its members returned home inconspicuously in small groups, ashamed and dispirited. There is good reason for thinking that Nicholas and his followers were the basis for the legend of the Pied Piper of Hamlin.

With varying fortunes the Crusades went on until 1272, when Prince Edward of England at the end of the Ninth Crusade finally gave up and sailed home.

For two centuries people from many parts of Europe were drawn into the Crusades. They learned to travel and to know distant lands. They moved eastward by many land routes and sea routes and they established ports at Malta and Cyprus and Acre. For years they lived in close and sometimes even in friendly contact with Turks and Saracens.

When the Crusaders came home they scattered throughout Europe and were regarded with wonder and curiosity. They enriched the folklore of Europe with stories of Eastern Lands. Any good Crusader and story teller knows that in order to dignify his victory he must have a worthy opponent! Therefore the Saracens were represented as fierce and cruel but also as mysterious, learned, brave and sometimes even as chivalrous.

But all the new interest in the Levant did not depend on popular stories. Travelers saw the solid evidence of cities like Damascus and Bagdad in the East and Cordoba and Granada in the West. Scholars saw that the Islamic people had control over arts and sciences which Europe had once known but which were now all but neglected and forgotten. So the Crusades built up a background of interest for the centuries of expansion toward the East.



ISLAMIC EXPANSION

The Islamic powers expanded rapidly from the 8th to the 14th centuries. They were checked by the Mongols and the Crusades. But see how at their greatest extension they reached from the Atlantic to the China Sea. The ports of Asia all the way to China knew their traders and were subject to their influence.

In part after Beazley.

THE ARABIAN GEOGRAPHERS

THE Islamic world, which was made known to Europe through the Crusades, was in fact well worthy of Europe's attention. Throughout the Crusades and for several centuries thereafter, it was in many ways more advanced than medieval Europe. In chemistry and medicine, in mathematics, astronomy and geography, Islamic scholars could have contributed to European learning, for they had developed both theoretical and practical information in these studies.

Such progress in science was not an inherent or natural part of the Mohammedan religion. Indeed the roots of this learning were older than Islam itself. In Persia and in other parts of the Near East, the Mohammedan religion was imposed upon a culture that was already old and that had survived many changes and conflicts.

At the beginning, the zeal and fanaticism of the Mohammedan conquerors rivaled that of the Christians in its destruction of intellectual values. In 640, Amrou took Alexandria. It is said he wrote to the Caliph Omar describing the books of the great libraries and that Omar replied: "If these books agree with the Koran, they are useless; if they disagree with it, they are pernicious. In either case they ought to be destroyed." There is a further story that there were at that time 4,000 baths in the city of Alexandria whose furnaces were fed by these books and that they kept the bath water hot for a period of half a year. This is no doubt an exaggeration since the libraries of Alexandria had already suffered damage by Aurelian in 273 and by the edict of Theodosius when the Christians plundered the libraries in 389 and 391.

While Europe disintegrated in a stew of religious wars and of local forays, scholars at the Courts of Persia and Arabia became the carriers of a scientific tradition. As with chemistry, physics and astronomy, so also with geography, knowledge passed from Europe to the East. Ptolemy of Alexandria had collected, codified and expanded a system of geography based on the classic writings. This book survived and was appropriated by the Arabs. In translation it formed the basis of the work called *Almagest.*

In those days Islam was too alive and alert to accept such a work slavishly, as the European scholars, for example, accepted Aristotle; additions were inevitable. As the fire of religious zeal swept over the deserts of North Africa to Morocco and Spain and burned its way through Persia, Afghanistan, and Turkestan into India, knowledge of necessity followed. The unity of religious belief and particularly the doctrine of the pilgrimage to Mecca bound the Mohammedan world together. They created a background that made exploration and geographic knowledge important assets to the spread of the faith. It became a task of honor to report to the Court and to the Mosque contacts with new countries and new peoples. In later years wherever the Mohammedan conquerors went, the scribes followed. Thus they not only traveled and fought over great tracts of Africa, the Levant and Asia, but they also left a record of their experiences. They were not like the Gothic Hordes, who came and vanished, leaving but a dusty trail like a storm in the desert. Before the year 1000 they had been to China, to India and had explored the eastern coast of Africa. Daring and learning mounted together and the story is preserved in the writings of Abu Zaid, Mas'oudi, Istakhri, Jakoubi, Edrisi and a score of others.

They built up in Arabic the records of a vast adventure.

SOLEYMAN (850)

OF all Mohammedan rulers, Haroun-al-Raschid is probably the most famous in the West, for the *Arabian Nights* has made him known everywhere. The Caliph al Mansour preceded him and the Caliph Mamoun followed. During the reigns of these three men Arabic geography developed rapidly. This is in the early part of the 9th century. In Europe, it is the time of Charlemagne and Louis the Pious. The Arabs began by translating the works of some of the Greek geographers. They also tried their hands at original work following somewhat the classic models. Observatories were built and astronomical calculations were used to establish the positions of different places. Alfergany and Mohammed Alkharizmy were the theoretical and scientific geographers of this period. But it was also the time of Soleyman the Merchant, the practical traveler.

The voyages of Soleyman are reported through the writings of an anonymous scholar who apparently took down the account. Soleyman appears to have traveled from the Persian Gulf to the Laquedive and Maldive Islands. From there he sailed to Sirandib (Ceylon). He at least passed by the Andaman Islands and possibly stopped there. He appears to have passed by the "Gates of China" (that is, the Straits of Malacca) and to have come to Khanfu (Canton).

Some of the things that Soleyman reports appear realistic and accurate, probably the result of personal observation. But mixed with them there are also hearsay descriptions and fables. It is this very mixture that gives his narrative so much life and interest. In the Islands he notes female sovereignty. He describes coral but gives to it the name of amber. In Ceylon he notes the existence of pearl fisheries and ruby mines. He gives a description of the mountain which is supposed to show the imprint of Adam's foot. He describes the practice of cannibalism as it exists in the Andaman Islands. Here is his description of a water spout: "In this sea there is often beheld a white cloud which at once spreads over a ship and lets down a long thin tongue or spout to the surface of the water, which it disturbs after the manner of a whirlwind; and if a vessel happens to be in the way, she is immediately swallowed up. But at length this cloud mounts again and discharges itself in a prodigious rain."

Of Khanfu (Canton) he gives us an extended, fairly vivid picture. He describes the system of taxation, and notes that it is necessary to have passports in order to travel in China. He is very impressed with the character of Chinese handicrafts and with the perfection of Chinese workmanship. He notes particularly the excellence of their porcelain. He is shocked at the Chinese system of legalized prostitution and gives a vivid description of the Chinese methods of punishment by torture.

IBN BATTUTÁ (1304-1377)

IBN BATTUTÁ is our last Arabian explorer. Though he is not the most scientific geographer, he is certainly the most indefatigable traveler. We have space only to record an outline of his itinerary. It would take a lengthy article even to indicate the richness and variety of his experiences and observations.

Battutá is a Berber, born in Tangier, the son of a *qadi* or judge. When 22 years of age, he sets out on his pilgrimage to Mecca. He goes from Tangier to Egypt, then to Damascus. He sweeps through Syria and Asia Minor and returns to Damascus. He makes the pilgrimage to Medina and Mecca, goes to Iraq and, making a detour through Khuzistan, reaches the city of Bagdad.

He returns to Mecca and is content to study there for three years. After this he is apparently restless again and so makes a voyage to the trading ports of the eastern coast of Africa. On his return, he decides to start for India but at the seaport of Jedda cannot find a ship. So he turns north instead, crosses Asia Minor, the Black Sea and comes into Mongolian territory. He crosses the Steppes of Central Asia, passes Khorasan and comes to the northwestern passes to India. By this time he has become a trader and acquired considerable wealth.

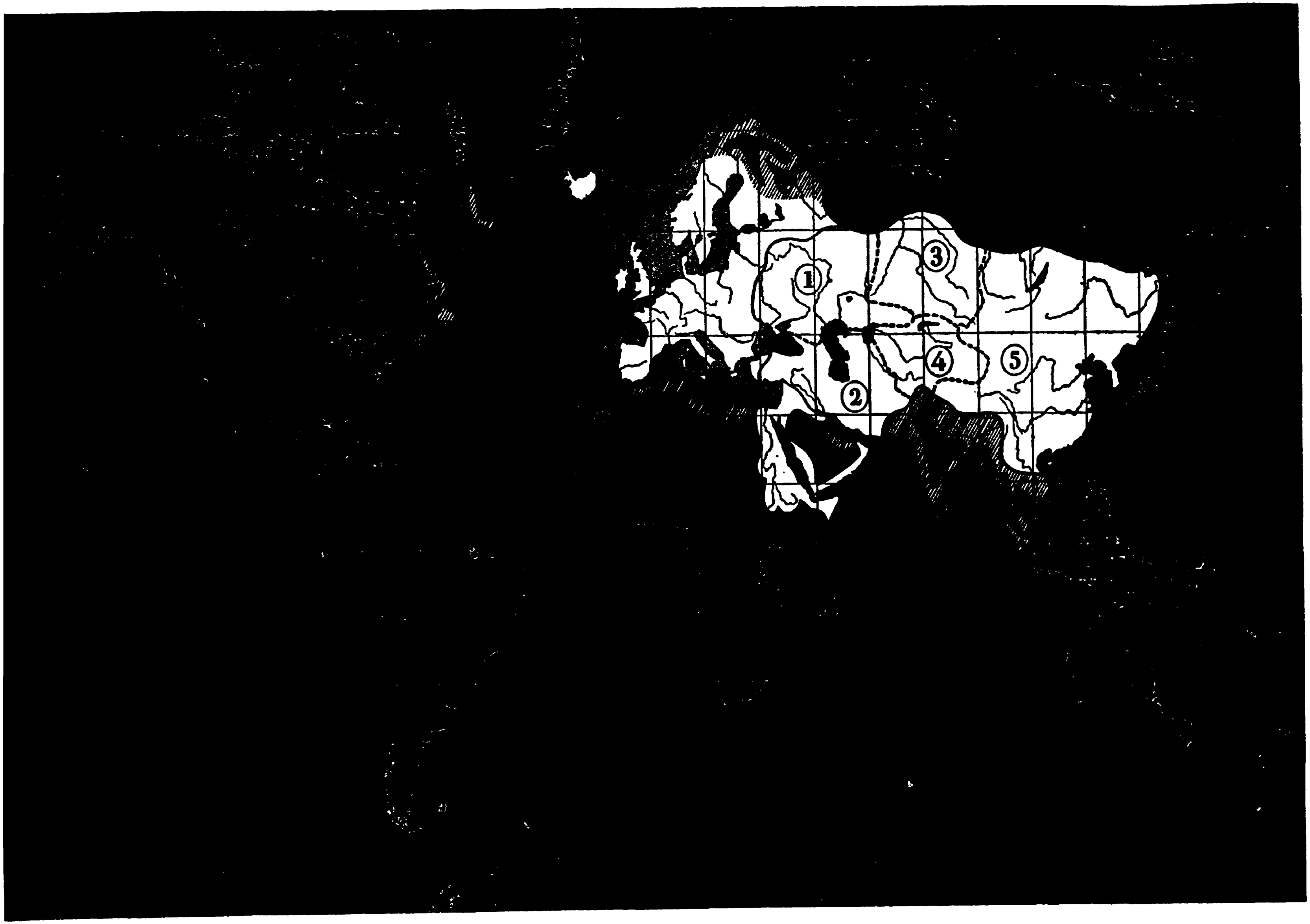
In India he proceeds to Delhi, lives there seven years and becomes a person of importance and honor. He starts for China with an embassy, acting himself as an envoy, but is attacked on the way. He loses his possessions and barely escapes with his life. He is afraid to return to Delhi and so drifts up and down the Malabar Coast. He goes to the Maldive Islands and becomes a *qadi* in the native court. In the Islands he is wrecked and rescued and after eighteen months finds his way to Ceylon. After further wanderings he starts for China again, visits Bengal and Assam, reaches Sumatra and boards a vessel for China. From the port of Zayton he travels to Peking in an endeavor to see the Mongol emperor, but fails in this for the emperor is absent. Embarking again from the port of Zayton, his vessel takes him to Sumatra and the Malabar Coast. In 1348 he is in Syria during the plague of the "Black Death." He visits Mecca again, travels through Alexandria in Egypt and returns to Tangier. He visits Moorish Spain and then, to finish off his travels, crosses the Sahara, travels in the Sudan, visits Timbuktu and sails on the Niger.

He gives an interesting and reasonably accurate account of his travels before he dies in 1377. He has personally visited every Islamic country and a number of infidel countries as well. Yule, the English scholar, estimates that Ibn Battutá had traveled at least 75,000 miles.

Had Battutá been a European, we would picture his roving life as involving a somewhat cheerless and loveless existence. This is far from the case. He was indeed quite a family man. In the portions of his narrative that have been translated into English there is record of at least ten marriages and evidence also that he usually managed to have about him a slave girl or two for company. This was the case when he was wrecked among the Maldive Islands. On one occasion he had made arrangements to marry the daughter of the Wazir Sulayman. When the daughter delayed and excused herself, the Wazir said, "The people have assembled, so what do you say to marrying the Sultana's mother-in-law?" He assented. The Wazir paid the dowry and Battutá concluded, "She was one of the best of women."

Returning through a town, after a long absence in India and China, he received news of not only one of his wives but a grown son as well. Nor were friends denied him. One of his friendships illustrates the extent of the Islamic community. In Delhi Battutá meets a man from his own part of the world (Tangier). Years pass and they meet again in Qanjanfu in China. The man's brother he knew later near Timbuktu on the Niger.

Everywhere he went he acquired influence and wealth, for he was a man of keen perception and of good judgment. Ibn Juzayy says: "Here ends the narrative which I have abridged from the dictation of the Shaykh Abu 'Abdallah Muhammad ibn Battutá (may God ennoble him)! It is plain to any man of intelligence that this shaykh is the traveler of the age: and if one were to say 'the traveler par excellence of this our Muslim community' he would be guilty of no exaggeration."



THE MONGOLIAN EMPIRE 13TH-14TH CENTURIES

On this map the utmost limits of the known world are shown. See how great is the Mongolian Empire. The limits of the Empire are traced by a solid line; its divisions by dotted lines. (1) Empire of Kipchak or the Golden Horde. (2) Empire of Ilkhan of Persia. (3) Empire of Sibir. (4) Empire of Zagatai. (5) Empire of Kublai, the Great Khan.

MONKS AND MISSIONARIES IN ASIA

THE NESTORIANS

DURING all the period when we assume contact between the Christian world and the Far East had died, an unexpected number of western people were streaming out over the steppes and mountains of Central Asia to reach the remote shores of India and China. They were not explorers; they were not travelers. Despite their great and long continued activity, they added little to the knowledge of the world. But they did get there and they stayed there.

These people were the Nestorian Christian Missionaries. Suffering from the hostility of the orthodox church in the West, they turned their faces eastward and went out to spread their gospel among distant peoples. They reached Syria, Armenia, Arabia, Persia, Khorasan, Herat, Samarkand, Peking and Singan fu in China, Kranganore in India. By 1265 their church had over 25 Asiatic provinces.

Their teachers came to the Malabar Coast in India in the 6th century. To this district also Thomas of Kana carried a band of Christians from Bagdad and Nineveh in 745. Another division of emigrants reached India from Persia in 822. Eventually the Syrian Christians in Malabar numbered 400,000. They were there when Da Gama came by sea to India and they suffered at the hands of the Jesuits and the Inquisition.

A cross found in Shensi, a province in China, with the script in Chinese and Syriac characters, sets forth an abstract of Christian doctrines and shows that the Missionaries had reached this far in about 636. The Nestorians were persecuted in China in 699 and 813, but for many years they prospered and some of the later Missionaries claimed several emperors as their patrons.

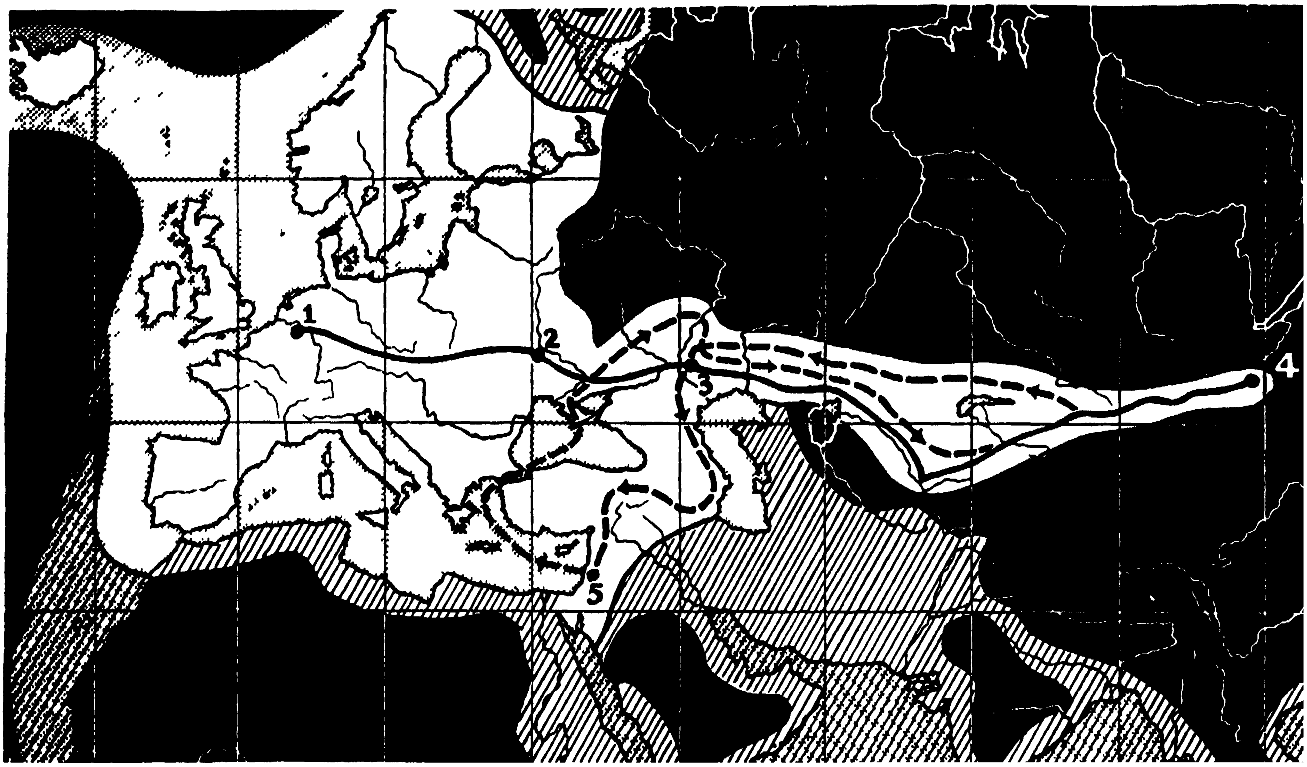
But, once they had departed into unknown Asia, the Nestorians seem seldom to have returned. What knowledge they gathered had little circulation in Europe.

Friar John to Mongolia

JUAN DE PIANO DE CARPINI (1182-1252)

WITHIN a hundred years the Mongolians developed from an obscure tribe into the masters of the greatest and most advanced empire the world had seen. In this time they had just five rulers, from Genghis Khan to Kublai Khan. Three of these were visited by great European explorers. Carpini gives us a picture of Kuyuk; William of Rubruck arrived in time to meet Mangu, and Marco Polo became the companion of Kublai Khan.

In the spring of 1241 Europe was terrified, for the Mongols were pounding on her eastern gates and pounding hard. They had taken Kiev in Russia, they had attacked Poland, the Hungarian mountains were in their hands and they had camps along the Danube. They came in great numbers and with great power, and nobody knew where they would stop. As a matter of fact we know that at this time their power extended from the Persian Gulf to Siberia and from the Hungarian Plain to the Pacific. It was the greatest empire that had ever been created under a single rule. But the princelings of 13th century Europe did not know this. They only knew the Tartars were fierce and savage, that they traveled fast and made war relentlessly and that there seemed to be an endless supply of them.



JOHN CARPINI, 1245 A.D. ———— WILLIAM RUBRUCK, 1252 A.D. . . . .

(1) Cologne (2) Kiev (3) Serai (4) Karakorum and Syr Orda. (5) Acre

A quiet monk was going about his business in the city of Cologne in that April. This was Friar Juan de Piano de Carpini who had been born in far-away Umbria in 1182 and who had been a modest but strong companion and disciple of St. Francis of Assisi. He must have heard stories of the Tartars and seen something of the disturbance that they were occasioning. He could not have foreseen then that this people was to absorb his attentions for as long as he lived and that he was to be the first European to leave a record of their country and their manners. The Pope himself was troubled. In 1245 he decided to send a mission to the Mongols and Friar John was selected for the task.

Just when Europe, shaken by factions and exhausted by small wars, lay open before them the Tartars faltered and withdrew a little. Europe did not know for five years that back in Mongolia Ogotay Khan had died and many chiefs returned to select his successor. But it was to Ogotay Khan that Carpini was to carry a message.

So in April Friar John and another friar, Stephen of Bohemia, set out from Lyons. In Bohemia, they talked with King Wenceslaus who knew something of the Mongols. It was at his advice that there was added to the party the Monk Benedict of Poland who joined them at Breslau and was to act as interpreter. At Kiev in Russia Friar Stephen turned back.

Here the trip began in earnest and here they first encountered the conditions of travel that they were to face through so many miles across the barren heart of the continent. Roads ended, carts had to be abandoned, European horses exchanged for small Central Asian ponies.

Carpini was then 65 years of age and a large man, more accustomed to the life of the priest than to that of the traveler and athlete. But he faced the journey resolutely. When the uncomfortable gait of the ponies shook him and lamed him beyond endurance, he wrapped bandages about himself so that he might stay in the saddle and went on.

They crossed the Dnieper, the Don and then the Volga, and to these rivers the Friar for the first time assigned their correct local names. On the Volga they came to the camp of Batu, the Mongol prince and nephew of the great Khan. Here for the first time Europeans had an opportunity to observe the real character of Mongols and it is all faithfully recorded by the Friar: their dependence on horses, the use of the *yurt*, or portable felt tent, the outlandish character of their clothes, their physical appearance which seemed so strange to a European.

It is not Batu's business to deal with these travelers. He orders them to proceed to the court of the great Khan. It is April, 1246, when they start off again. The friars have been fasting for it is Lent and they are both weak and ill. None the less they post on, often exchanging their mounts four times a day. They pass north of the Caspian, crossing the Aral River and then the Jaxartes or Syr Daria. Their route carries them along the shores of the Dzungarian Lakes. After 106 days of travel they reach Syra Orda (Yellow Pavilion, or Court of the Khan) which is near the capital city of Karakorum. They have traveled in this time over 3,000 miles, a record of progress worthy of any Asiatic traveler.

While they have been on the way the original khan, Ogotay, whom they set out to find, has died. They are present when Kuyuk, the successor, is enthroned and when 4,000 envoys from all over Asia have come together to do him honor and bring tribute. It is one of the fortunate accidents of history that the observing Friar should have arrived just in time to give us a picture of one of the greatest Oriental rulers on this significant occasion.

But the meeting hardly brought much joy to Friar John. The Khan did him scant honor, though he received him, listened to his message and questioned him. After a long delay, occasioned by the ceremonies attendant on the enthronement, the Friar receives a letter which he is to bear to the Pope. (This letter has in recent years been rediscovered in the records of the Vatican.) The letter is written in Arabic, Mongol and in Latin and it says that Kuyuk is the scourge of God, all powerful on earth, that he will be pleased to receive the Pope as representative of the princes of Europe and accept his tribute. "You in person, at the head of kings, all together, without exception, come and offer us service and homage. Then we shall recognize your submission but if not then we shall know that you are our enemy."

The coronation ceremonies drag on. It is November when the Khan dismisses the monks and with their insulting letter they start home through the scant naked trees of the frozen river bottoms, over the bare mountains and across the salt pans and the sandy plains of the desert. Always they are whipped by snow and cut by the bitter wind. From records of other travelers we can gather some appreciation of the miseries of winter travel in Central Asia. There is little reflection of these miseries in Carpini. He never burdens his account with stories of personal hardship. Early in his narrative he gives us a brief but comprehensive description of the continental climate of the steppes and of the difficulties of desert travel. This description is controlled, keenly observed and done in an almost impersonal fashion.

"In certain places thereof are small store of trees growing but otherwise it is altogether destitute of woods. Therefore all warm themselves and dress their meat with fires made of dung. The air also in that country is very intemperate. For in the midst of summer there be great thunders and lightnings, and *the same time there falleth great abundance of snow. There be also such mighty tempests of cold winds, that sometimes men are not able to sit on horseback. So great is the great wind that we were often constrained to lie grovelling on the earth, and could not see by reason of the dust. There is never any rain in winter but only in summer albeit in so little quantity that sometimes it scarcely sufficeth to allay the dust or to moisten the roots of the grass. There is oftentimes great store of haile also. Likewise in the summer season there is on the sudden extreme heat and suddenly again intolerable cold."*

Coming back in the winter they had to sleep in the snow. With their feet they would kick through the snow for a bare place in the sand in which to lie, but often by morning they would be covered by snow again. Then they went on.

It is June in 1247 when they return to Kiev. They had been given up for lost, but when news of their arrival reaches the city the joyful people stream out of the gates to welcome them and bring them in. Everywhere they are welcomed and cheered. They cross the Rhine at Cologne. They find the Pope at Lyons and deliver their letter.

Friar John is made the Archbishop of Antivari in Dalmatia and sent as legate to the court of St. Louis. He enjoys his honors until 1252, when he dies at 70 years of age.

Friar William

William of Rubruck (1215-1270)

CARPINI died August 1st of 1252, and just a few months before his death the second envoy from Europe to the Mongol Khans started his long journey. This was William of Rubruck, another monk who went out at the order of King Louis IX of France to whose court Carpini had been attached. King Louis was on a Crusade so Carpini went to him at Acre and from there to Constantinople. It was a year before he could sail from that port to the Crimea.

From the Crimea Rubruck and his companion, Friar Mathew of Cremona, crossed Carpini's track. Then they ran parallel to it, keeping in general east and north of it. They traveled by cart instead of on horseback and so it took them almost twice as long as it had taken Friar John. They came finally to Syra Orda, the court of the great Khan, the day after Christmas and soon after moved with the court to the great capital itself, Karakorum. Karakorum is now a crumbling heap of ruins that is being again engulfed by the desert out of which it rose. Even expert geographers and archeologists have a hard time to rediscover it. But once it was the capital of the great Mongolian Hordes and their dependent empires. The Mongolians were so attached to their camps and their nomadic life that Karakorum was one of the few permanent cities to be found anywhere in their vast plains.

Friar William gives us a good description of the Mongol court. Just as his journey was more leisurely than Friar John's, so is his writing. He has more time for observation but his account lacks the pace, energy and directness of the great Franciscan—still it is a fine record. It reflects some of the bewilderment and disgust that the European always feels on close contact with an alien culture. It repeats some of the arguments and discussions between the Friar and the great Khan and as a side-light it shows us the hostility that existed between Rubruck and representatives of the Nestorians and other Christian sects that were also present at the court, a hostility which was not lost upon the Oriental ruler.

It tells us also of lands which interested the Friar but which he never had an opportunity to visit, of people to the north of Mongolia who fastened devices of polished bone on their feet and who traveled over the ice and snow with such rapidity that they could capture animals they were pursuing. And again, of another land which lay beyond Mongolia to the east and south which he reports as "great Cathay." Here lived a people, the Seres, who produced the most excellent of silk cloth. This is the first time since the days of Ptolemy that any European had known that the silk trade had its origin in Cathay.

Both Carpini and Rubruck refer to a number of humble and unknown Europeans who had made their way to the Mongol court: there is Cosmas, the Russian silversmith who made a throne for the Emperor; Paquette, the woman from Lorraine, who had been captured in Hungary, carted eastward as a slave and who served a Christian lady of the court; there were even families with European children.

Friar Mathew decided to remain behind to preach in Mongolia. William of Rubruck returned, leaving on July 6, 1254. As far as the Volga he went back by a route only slightly different from that which he had followed on his outward trip, but at the Volga, he turned south instead of continuing to the Black Sea, for he believed that Saint Louis might still be in the Holy Land. He reached the Mediterranean at Corycus in the spring of 1255. But Louis had returned to France. Friar William went to Acre to his monastery and wrote his account of the trip which was sent to the King.

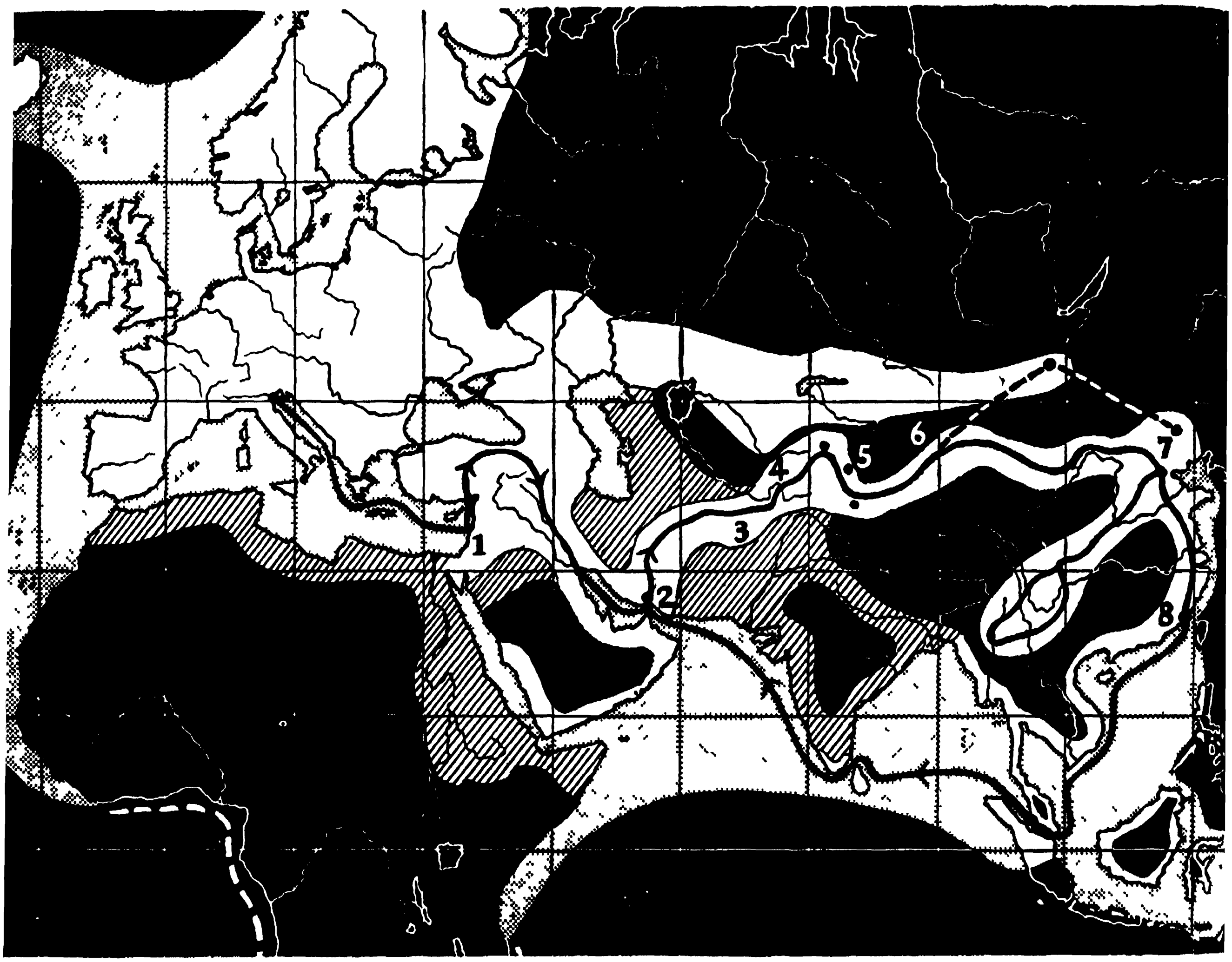
MARCO POLO (1254-1324)

MARCO POLO wrote one of the world's great books. It is indeed several books rolled into one. It is a narrative of adventure, a history and description of the Mongolian Empire and an encyclopedia of new countries and strange peoples. At an earlier time Polo could not have made his trip or if he could, his book would not have been so rich, for he would have been dealing with a limited and not a united China. At a later time his travel would have seemed less extraordinary and his narrative would not have had the same freshness. It was the unique privilege of Polo to give Europe its first panorama of the Orient. It was his privilege to reveal one developed civilization for the benefit of another civilization.

And yet this book is an accident, an afterthought, a by-product. The book was made because two men met in jail. The book is so big in its meaning and so packed with fact that we cannot hope here to deal with all of Polo's accomplishments. We can however see what went into the making of the book, what kind of a man it was who made it and what he accomplished.

In 1255 two Venetian merchants were trading in Serai which is beyond the Black Sea along the route that Carpini and Rubruck had followed in going to Karakorum. This was already far afield for an Italian trader, but a regional war between Tartar chiefs on the route home urged these men who were brothers, Nicolo and Maffeo Polo, to travel as far south as Bokhara. Bokhara was then a prosperous trade center and important in the newly expanded Mongolian Empire. This was well enough but the brothers did not know where to turn next. At the end of three years they joined an important ambassador who was passing on his way to the court of Kublai, the great Khan.

Here they arrived after a year of continuous travel. They were shown every honor in exchange for which the Khan sought information



MARCO POLO, C. 1254-1324

(1) Acre. (2) Ormuz (3) Hindu Kush, Balkh. (4) Pamir Plateau. (5) Káshgar, Yarkand, Khotan. (6) Lop (Lob). (7) The dot above Shangtu (Ciandu, Chandu, Xanadu of Coleridge). The dot below Cambaluc (Peking, Peiping) (8) Zaitun (Zayton), from here Polo sailed in junks for Persia with the Mongolian princess

from them regarding life in Europe. Stimulated by what he heard and pleased with the Venetians, the Khan sent back with them an ambassador and a letter requesting that the Pope send 100 teachers and men of science to Cathay. On the return to Europe the Khan's ambassador was taken ill, but the brothers proceeded and after three years of delayed travel reached Acre on the Mediterranean, only to find that the Pope had died and that there was delay in appointing his successor. They reached Venice in 1269. The wife of Nicolo had died in giving birth to a son named Marco, who was then 15 years old. For two years the election of the Pope was delayed while the brothers waited in Venice for an opportunity to present the Khan's courteous letter.

This letter was certainly very different from the hot and haughty messages that Carpini and Rubruck had brought back with them. It reflected the altered fortunes and character of the Mongol rulers.

The earlier Khans had been horsemen, plains-men, campaigners and conquerors, but gradually they had been absorbed into the life of the great cities and the rich valleys of Central China. The Khans and their lords had had, almost of necessity, to acquire something of the arts and sciences of the people they had captured. Kublai Khan had now moved his capital far away from the Altai Mountains and the barbarous city of Karakorum on the bleak plains, though these parts still were important as the ancestral home of the Tartars. Kublai had absorbed and exceeded the standards of Cathay. He had built larger cities, nobler palaces, pleasanter parks, collected more taxes and extended his rule in every direction. He knew that though you can conquer distant nations with armies of flying cavalry, you need more than this to rule them and make them an empire. You need laws, languages, arts, sciences, the influence of religion, even the advice of foreigners. So the letter to the Pope waited in the house of the Polos!

But there was no Pope. Ashamed of failing the great Khan, the Polos started back to China, taking with them Marco, age 17. So he began one of the greatest adventures that history has permitted any man. From a papal legate at Acre they got a letter of explanation to take to the Khan. Hardly were they under way when a letter recalled them. The legate had been elected Pope. He would send two specially selected delegates to the Khan—two out of the hundred requested. The party started off again. But such was the character of these delegates that when they heard of local wars in the Armenian territory, they turned around and scuttled for home. The Polos were not deterred. They passed through Tabriz into Persian territory and by way of Yezd and Kirman to the port of Hormuz. They intended to take a ship to China, but could find no appropriate passage. They turned north and commenced the first complete trans-Asiatic journey from sea to sea.

As nearly as it can be identified this was the general route of that crossing. They returned to Kirman and then proceeded through the mountains of Khorasan to Balkh and Badakshan. Then, following up the valley of the Oxus, they passed beyond any territory that had been covered by Alexander and his troops. They reached the high mountains and came into the great Pamir Plateau. This region had never before been described and Polo was the first to give it a name in literature. With the possible exception of Benedict Goes, the region was not crossed and not visited again until John Wood came there in 1838. They traveled 12 days through this barren country where there were no habitations and from which even the birds and animals seemed to have fled. Polo said, "So rare is the air that the fires when lighted do not give the same heat as in lower situations, nor produce the same effect in cooking food."

Leaving the Pamir region after 40 more days of desert, through mountains and valleys where every provision still had to be carried with them, they came to Kashgar, then to Yarkand and Khotan. This region also remained unknown to Europeans until 1860. At Pein near Khotan, Polo reports mountain streams that wash down stones of chalcedony and jade. In our own day Hedin remains one of the very few travelers who has described these streams. From there they passed to the region of Lop (Lob) with the city of that name on the edge of a great desert. This was not reached again until Prjeválsky, the great Russian explorer, came in 1871. Then they followed the trade route across the Gobi Desert. At last after three and a half years, that is in 1275, they heard that the great Khan was at his summer palace in Shangtu and so proceeded toward him. He also had heard of their approach and when they were still 40 days away sent aides and escorts to bring them in honor to his palace.

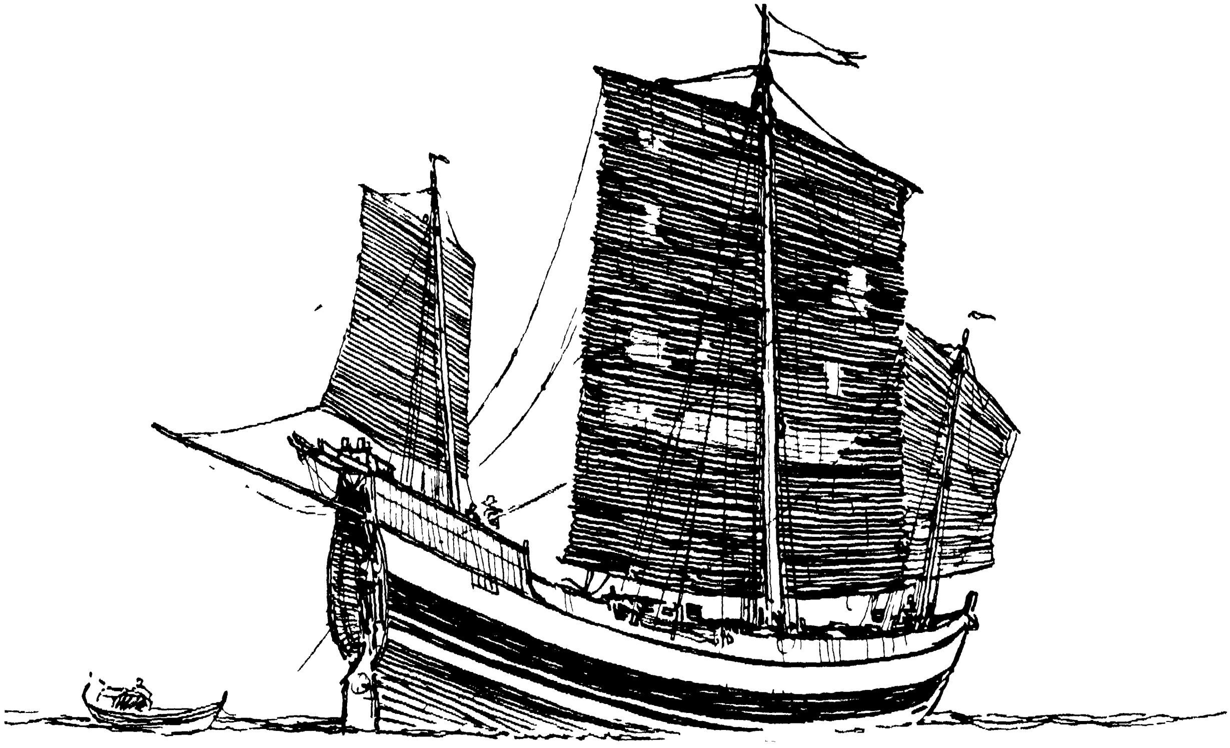
The Khan was disappointed at the failure of the Pope, but the elder Polos were almost old friends and Marco, who was now a young man of 21, pleased the Khan greatly. Then began for Marco Polo a life that was exciting and so novel as to be almost miraculous. While the elder Polos seem to have settled down to prosperous trade, Marco was absorbed in serving the Khan. In addition to Persian, which he seems chiefly to have used, he learned several other languages. He traveled everywhere and saw everything, and returned to the Court to make a report to Kublai Khan. He was, for example, governor of the city of Yangchow for three years.

The China of those days exceeded anything that had up to that time been known in Europe. There were vast numbers of people congregated in great cities, larger than any cities in Europe. There were great palaces whose parks were miles and miles in circumference and whose roofs were wrought in gold. Zayton was the greatest port in the world and here came great junks with four masts and crews of two or three hundred men. The traffic of small ships on the great rivers was numberless and ceaseless. There were vast engineering works such as the Great Wall, and the Grand Canal, 1,200 miles long, that ran from Peking to the sea at Kinsai (Hangchow), about 600 miles of which had been built during Kublai Khan's rule. At this time China had long known the use of paper and of printing from blocks. It had already an official encyclopedia printed under the direction of the Emperor in over 1,000 different sections. It printed an almanac; the number of copies printed and sold for the single year 1332 was 3,123,185. Astronomical instruments were used and water-clocks displayed on the many bridges.

Polo tells how black stones (coal) were dug out of the ground in certain parts of the country and burned. He notes that in many places these black stones were cheaper than wood, that the fire was hotter and lasted longer. He speaks of paper money and describes its use as currency. He describes the organization of the Imperial army and the system of posts and messages used on the national highways. At one point, he tells how a fiber was taken from the earth and spun into thread and the thread woven into cloth and the cloth was put into the fire and was not consumed but became white. The cloth was never washed but put into the fire to whiten it. It was said the Khan had sent a cloth of this asbestos to the Pope. On almost every page there are notes of things that were wonderful to him and they remain wonderful to us, too.

It is not our business to compare and contrast civilizations. But of Polo as an explorer we must note that he visited Shansi, Shensi and Szechuan. That he went into the wild country at the borders of Tibet. That he made a loop in southern China coming into portions of northern Burma. He probably visited Karakorum in the north and went as far south as southern Cochin-China. On one occasion he casually remarks that he was returning with a fleet from a trip made for the Khan to the East Indies. He kept notes of his travels and always brought back reports for the instruction and delight of Kublai Khan. He did all this so well that the Emperor kept the Polos by him, delaying their departure from year to year. It was not until 1292 that they were permitted to depart and then only because Marco was deemed an ideal leader for an expedition that was to escort a Chinese princess to Persia to become the bride of the Persian Khan.

So, with the Princess and their accumulated great riches, they proceeded to the port of Zayton, the harbor which was at that time the greatest port in all the world. They sailed in state in a fleet of many ships. They were detained in Sumatra and had difficulties with storm and sickness in southern India. Many died on the passage which occupied two years. By the time they reached Persia the Khan was dead but the



THE CHINESE JUNK

THE Chinese junk served to extend the range of European exploration when it carried travelers like Oderic of Pordenone, Friar John of Monte Corvino and Marco Polo on their Oriental travels. The Chinese were from immemorial time the great navigators and traders of the Eastern seas. In Polo's day their great vessels were plying regularly to Sumatra and Java and the farther islands. There were very many different kinds of junks, small ones for the rivers and canal and great clumsy structures that dared the sea. Our drawing shows one of the types. The form of hull and rig have persisted to the present day. Even the use of rattan sails or sails made of matting has survived.

Some of the sea-going junks of Polo's time were very large indeed. Most of the early European travelers were struck by them and described them in much the same terms, so we may accept their descriptions as relatively accurate. They carried 200 to 300 men as crew. The hull was divided up in apartments occupied by important travelers, their women and their retinues of servants. There was place as well for cargo and stores. The vessels were elaborately decorated outside as well as within. Many of them carried boxes of earth in which plants and flowers flourished. They were unwieldy and slow but very capacious and very strongly built.

Princess was delivered safely to his son. Passing by way of Tabriz, Trebizond, and Constantinople, they reached Venice in 1295.

They had then been away 24 years. They were worn and weary with travel and dressed in strange costumes so that, it is said, they were not for a while recognized, even at their own home.

Three years went by and the Polos were known locally for their wealth and experiences in travel, but no written record of their knowledge existed. Then there was a naval engagement with the Genoese and Marco, who was a captain of one of the vessels, together with 7,000 of his fellow citizens, were taken as prisoners to Genoa. Here he met a prisoner from Piza by the name of Rusticiano, who must have been a man of curiosity, of judgment and patience, for it was at his insistence that he obtained from Polo's dictation and from his notes a record of the travels. This no doubt accounts for the fact that the traveler is always referred to in the third person. Apparently until he was in prison Polo had no intention of writing or of systematizing his vast information. And thus by accident, this extraordinary book was produced. Marco Polo was released and we judge from the date of his will, made at 70 years of age, that he died in 1324.

They say that Polo, dying, was asked by his religious friends to recant all the lies he had told and he replied, "I have not told half of what I saw." That story reflects the attitude toward Polo's book. In those days everybody read it and few believed it. Nowadays research has shown that nearly all the book is a record of true observation and that Polo only occasionally gave way to fancy or exaggeration. It is said that his book did not have a great influence in his time, yet scattered over Europe there are still 100 manuscript copies of the work in many languages that were made before the book was even printed by Ramusio in 1559. In the Catalan Atlas of 1375 Asia is drawn from information provided by Polo and this is probably true of other maps and of the Behaim Globe which was drawn just at the time Columbus sailed in 1492.

Columbus knew in detail of his travels. In the Colombina in Seville there is preserved a copy of this book by the greatest traveler in the East that was owned by the greatest traveler to the West. Columbus has written notes on over 70 of the folios. Columbus accepted in his mind the premise that the world was round. He accepted from Polo that Asia was very large. Out of these true premises he reached the false conclusion that the Atlantic was a small body of water and provided a short route to India.

AFTER POLO

As long as the Khans kept the great Mongolian Empire together, Europeans continued to travel to China. They went out either by the northern route to Mongolia that Friar John and Friar William had first followed or by the southern route through Persia that Marco Polo explored. Occasional travelers also went overland to Ormuz in Persia and sailed from that port for India or China.

The northern trade route became very popular with merchants from Florence and Venice; so popular indeed, that in 1350 Pagolotti and

Pagnini published a kind of Baedeker for travelers to Mongolia.

The missionary explorers followed the southern routes. The first of these was John of Monte Corvino. For a time he had a station at Tabriz in Persia, then he went to southern India and reached China in 1293. He established the Roman church in Peking and continued work in China until he died. He was about 58 years of age in 1305 when he sent beautiful letters to the Pope giving a clear picture of his life in China. He tells how he bought 150 Chinese boys and taught them to read and write Greek and Latin; baptised them; taught them the Scriptures and trained them into a choir. He acquired land near the Royal Palace in Peking and built there a chapel with a steeple and three bells. The great Khan could hear the bells ringing and the choir singing and it pleased him to hear this when he was walking in his gardens. He seems to have treated the priest with urbanity and even to have shown respect for Christian emblems; but he was never a convert.

Andrew of Perugia went to Zayton. He wrote very little about China but he sent home one burning paragraph that strengthened the impression that Marco Polo had made: "As to the wealth, splendour, and glory of this great emperor, the vastness of his dominion, the multitudes of people subject to him, the number and greatness of his cities, and the constitution of the empire, within which no man dares to draw a sword against his neighbour, I will say nothing, because it would be a long matter to write, and would seem incredible to those who heard it. Even I who am here in the country do hear things averred of it that I can scarcely believe."

But of missionary travelers the greatest was Friar Oderic of Pordenone whose journey lasted from 1316 to 1330. From Constantinople he crossed Persia, sailing from Ormuz for China. He stopped at Malabar, Ceylon, Madras, Sumatra, Java, Cochin-China and reached Canton. He was in northern China between 1332 and 1338. He gives a brilliant description of the city of Hangchow and of his passage by the Grand Canal to Peking. He returned overland through Ordos to Shensi and then to Tibet and is the first European to give us a description of Lhasa.

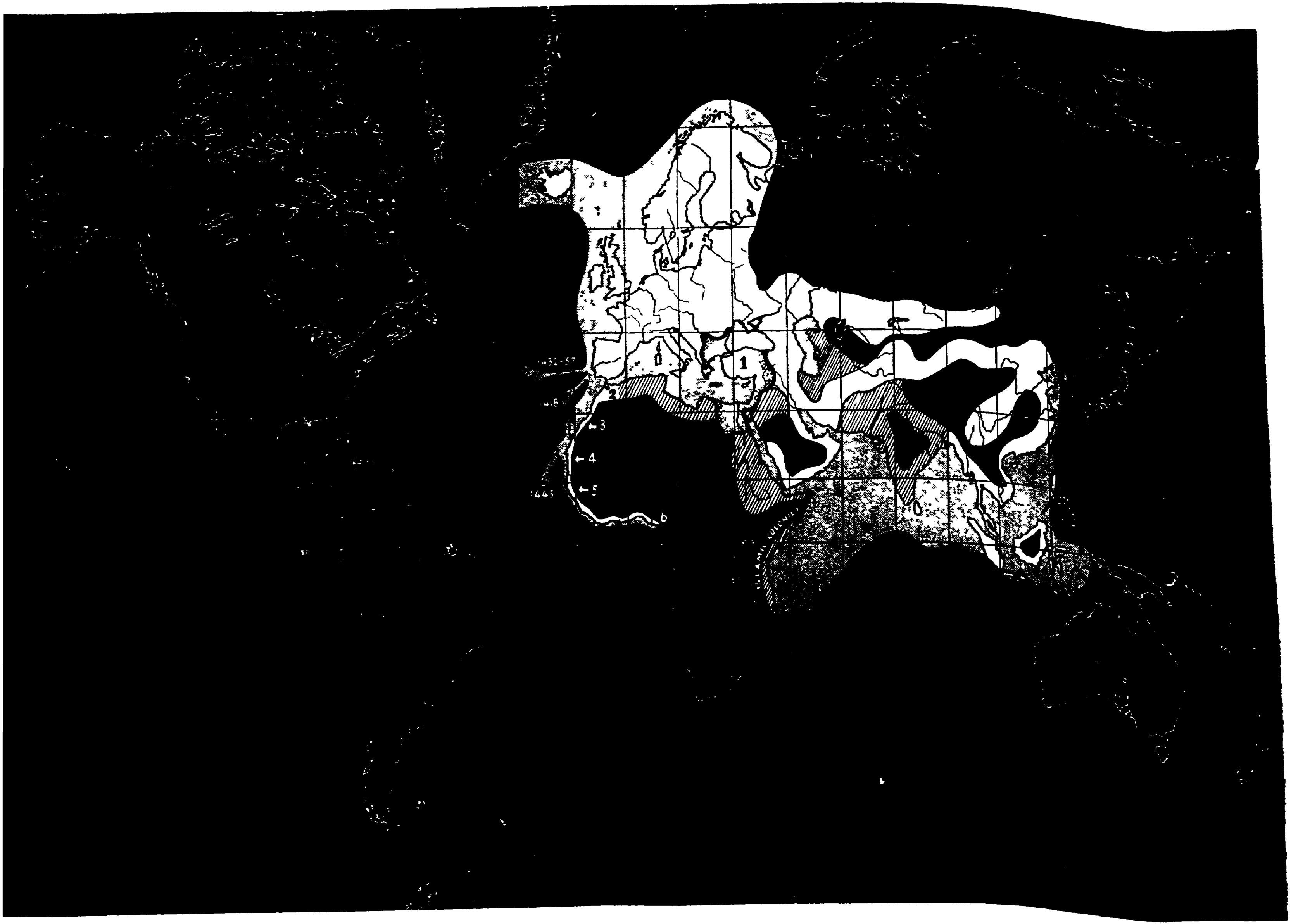
There were of course other travelers besides missionaries. We might for example journey with a business man named Clavijo who went to Samarkand in the beginning of the 15th century, saw that great city in the days of its prosperity and was admitted to the magnificence of Timur's court. Or we might follow the strange wanderings of Hans Schiltberger who saw the court of Timur from the point of view of a slave. Despite his humble position Schiltberger saw parts of the world that no one else reached and left descriptions of great importance. He left Bavaria as a boy to fight against the Turks with the army in Hungary. He was captured at Nicopolis in 1396 and taken to Constantinople. Timur's army captured him from the Turks in 1402 and he was taken to Samarkand. Three years later Timur died. A new master bought him and took him to Tobolsk and Tomsk in Siberia. Under one master he visited Mecca, and his account of the Mohammedan religion and the life of the Prophet is surprisingly clear and reasonable.

So it was that during the Mongol peace travelers and missionaries opened a gateway through which for a time Europe saw the vast landscape of Asia. There was an Asia that was bitter and barren and savage; an Asia that was unclean, mysterious and pagan; and an Asia golden, scented, silken and spiced. Then the gate closed again. Timur died and the great empire of the Mongols crumbled. Ottoman rulers began an extension of their power. The tolerance and the love of learning of later Mongols were displaced by the fanaticism and hostility to foreigners that frequently characterized Mohammedan rule. In China itself anti-foreign ideas began to gain ground. Europe was cut off from direct trade with the Orient. Travel was again dangerous and trade passed at great cost through many intermediary hands. The Turk and the Saracen barred the way.

But Europe had seen Asia. The effort to recover that vision and that contact with the fabulous Orient provided the driving force for centuries of exploration. It sent the Spanish ships westward across the Atlantic to the Caribbean. It started the Englishman and the other sailors of northern Europe looking for a northwest and a northeast passage. It sent the caravels of Portugal reeling around Africa on their way to India, and it was they who first reëstablished direct contact with the Orient. The vision of the Orient had strange by-products: it led Columbus to disclaim his own discoveries; for *centuries Africa lay practically unexplored because it was regarded as no more than a detour on the road to India.*

PART III

THE GREAT AGE OF ADVENTURE



EXPEDITIONS UNDER HENRY THE NAVIGATOR, 1415-1461

(1) Ottoman Empire—Middle of 15th century—blocking way to the East. (2) Ceuta, which Henry captured in 1415. (3) Cape Bojador, 1434. (4) Cape Blanco, 1441. (5) Cape Verde, 1445. (6) Bight of Biafra, 1461.

PORTUGAL

HENRY THE NAVIGATOR (1394-1460)

THEN the way to the East was blocked. By the year 1400 the great Mongolian Empire had begun to break up into smaller and disconnected units. The Ottoman Empire had grown and developed, blocked trade at the eastern end of the Mediterranean and placed fresh burdens upon it. Both the northern route and the southern route were cut off. For the moment we must withdraw our attention from the spacious scenes in Asia and focus it instead on a small, neglected country in western Europe and on an unknown prince.

At the beginning of the 15th century there was no particular promise in Portugal. It was merely one of several small states that occupied the Iberian Peninsula. It had succeeded in driving out the Moors. By the middle of the 13th century it had already established the approximate boundaries that define it today. For the time being it was independent of Spain but there seemed no future for it. Its very separation from Spain cut it off from the rest of Europe, and Europe itself was in a turmoil, occupied with a seemingly endless succession of local wars. Trade lagged and Portugal lay apart even from this dwindling commerce. It had only the sea and ships.

The Portuguese ships were good ones. They were small vessels of not more than two hundred tons, but useful for fishing and commerce. They carried smart lateen sails on three masts and with this rig they were handier and lay closer to the wind than other contemporary vessels which set square sails on cumbersome yards. But where was Portugal to send these ships? She had only the Atlantic seaboard. The Moors controlled the Strait of Gibraltar. The man that faced this problem was Prince Henry of Portugal.

The third son of King John, he was young, unimportant and not likely to sit on the throne. But this young Henry hated the Moors. He revived one of the old Crusading orders, put himself at its head, and under its white-cross banner drove the Moors from Ceuta in Algiers in 1415. As not infrequently happens, the wise conqueror learned from his enemies. He came in active touch with their vast religious and political system. He learned that in Africa the land stretched endlessly to the east and south; he saw that the despised Moors had ships and sciences and commerce. Here were lands for conquest! Why shouldn't Portugal prosper by its proximity to these lands? Henry came home with ideas in his head.

He came home also to find his triumphs spread abroad and to learn that he had become powerful almost over night. Command of the English armies was offered to him by King Henry V. The Emperor of Germany wanted him for the command of his forces. It was clear that he might play a great part in European affairs.

Now Henry surprised everyone and disappointed his friends. He rejected all these offers and turned his attention to the study of the sea. "Henry, the Navigator," they called him and it became a kind of jest to add rapidly and slyly, "He never goes to sea." But he knew what he was doing, even if others did not. He began to question navigators, traders and map makers. He interviewed many, not neglecting foreigners that came to the Portuguese ports nor failing to use the advice of the Moors. The best he kept in his employ. He took up the science of navigation and became an expert in it. Navigation as we understand it today was then a poor, undeveloped thing but Henry gave it a new life. He earned every bit of his title even though he never stood on the quarter deck and "shot the sun." He was an expert in all that pertains to the development of ocean travel. He was a navigator in the wider sense of being one who understood the use and management of ships.

The more Henry progressed with his studies, the less interest he took in European politics. By 1420 he had built at Sagres a kind of observatory and school for navigators.

Sagres is a bleak and deserted promontory just within Cape St. Vincent, the southwesterly tip of Europe. Sailing by the Cape today you can still observe the white remains of some of the buildings that Henry erected. To this spot he removed his collections of maps and books. In 1438 he again disappointed the Court when he retired to this spot and shut its doors upon the outside world. This was a strange development for the handsome young man of action who might have commanded the armies of Europe!

People were puzzled about Henry; they are still puzzled. He must have had real character, for commentators disagree so radically as to what that character was. Some see in him one of the last Crusaders, moved by a religious zeal to crush the infidel. Some see in him a medieval-minded monarch who believed implicitly in Prester John. Some say that Henry was the first of our modern scholars and that his clear aim was knowledge coupled with an expansion of Oriental trade. Some say that he was a vague and impractical man and others that he foresaw and prepared for the great Portuguese voyages around Africa to India; the adventure that for a while made little Portugal one of the great empires of the world.

Henry only appeared to have turned his back on affairs. Actually, through his students and scholars, he was in touch with all of Europe and was sitting at the core of a developing world. He used the small neighboring port of Lagos as a center from which to fit out the expeditions which he began to send abroad upon the sea and to follow the coast of Africa. He told his captains to report all harbors and trade routes. He sent priests along to convert the heathen, instructed his ships to find the African river that led to the Court of Prester John.

Two results grew out of Henry's activities. An unintentional result was the establishment of African slavery; an intentional one was the growth of Portuguese trade and power.

In 1418 one of Henry's ships, under Marco Zarco and Tristan Vaz, discovered the Island of Madeira. It was colonized a few years later and thus was established the first of Portugal's great chain of foreign ports. In 1434 one Diaz rounded Cape Bojador. This was the farthest south on the African coast that had been reached by any European vessel at that time. In 1441 another Portuguese ship sailed as far as Cape Blanco on the Moroccan coast. In 1445 Diniz Diaz, driving his ship far beyond this cape, came suddenly on a promontory with green bushes and a small cluster of tall palms upon it. In the five hundred years that have elapsed since then there has been no change in the appearance of the West African coast. The palms still look green, and the appearance is still illusory. But after sailing eight hundred miles along the desolate desert coast it is easy enough to understand why Diaz called the spot "Cape Verde." He had discovered the westernmost point of Africa. A year later another expedition reached the Cape Verde Islands. In 1458 Henry sent out his last expedition. The vessel under Diago Gomez rounded Cape Verde and, sailing farther, came to a river to which they gave the name "Rio Grande." These are all the discoveries that we can definitely credit to Henry's own expeditions. But there is some evidence in the shape of an old map for believing that as early as 1440 a Portuguese vessel may have reached the South American coast near Pernambuco.

The stream of voyages which Henry initiated continued; they carried the banner of Portugal around the Cape and to India. Henry's brother sat on a throne, but he himself established a great tradition and determined the destiny that Portugal was to pursue to its glory. Henry died in 1460, and that year Da Gama was born, the man who was to fulfill Henry's dreams.

A Note on Prester John

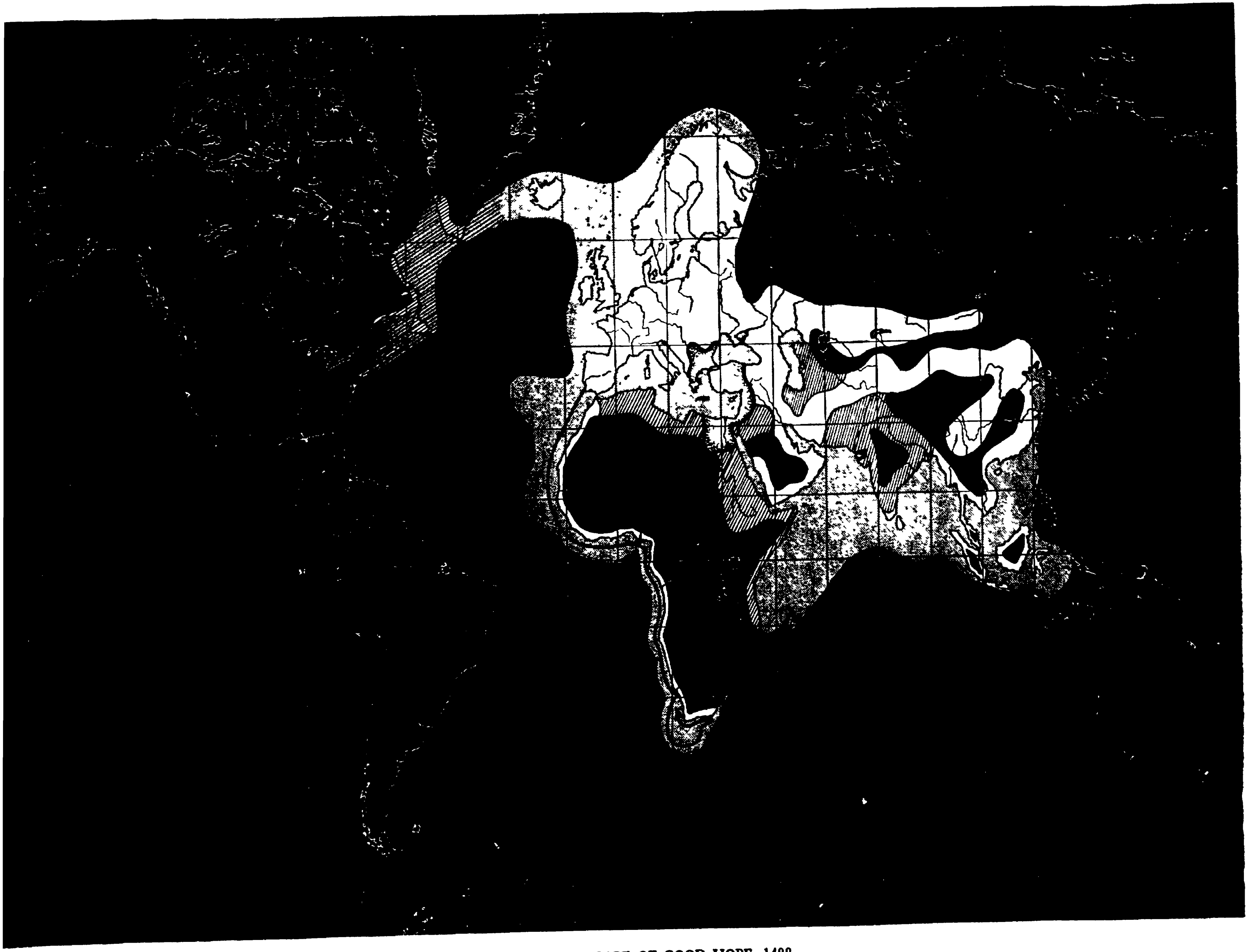
PRESTER JOHN was a great priest and king who ruled a vast empire in the East somewhere beyond the limits of the world that was known to Europe. He was powerful in "India"—that vague land that might be any territory from China to Africa. Hundreds of kings and emperors were supposed to throng his great halls, serving him reverently and doing his bidding. His palaces, his stables, spread over a great city. His throne was built of emeralds and rubies and pearls. At his tables 30,000 followers sat down to feast. When he himself dined, 7 kings waited on him, 62 dukes and 265 marquises. Twelve bishops stood at his right hand and 20 bishops at his left. He might have taken any title, yet he was humble. He was known simply as Prester John—that is to say Presbyter, John the Priest.

That was the essential feature of the medieval legend—Prester John was a Christian king, sympathetic to the aims of European monarchs, bishops and popes. He was the hope of the Christian world in the East—an ally. Nobody had seen Prester John, nobody knew exactly where his kingdom was, yet everybody believed in it. Even the travelers who penetrated the East believed in him and brought back stories of his powers and his accomplishments. When it was proved his empire did not exist in Media and Persia he was moved to Central Asia. When he was not found in Asia it was believed he had been defeated there but that he or his successors ruled a kingdom in Africa. Europe was hard pressed and divided; it needed Prester John and would not let him go.

Prester John was based remotely on fact. From time to time the Nestorian Christians influenced some eastern monarch and he became the Prester John of his time. In 1141 a Turkish Khan defeated a Seljuk Sultan. The victor had been friendly to the Nestorians, so he became the basis of the Prester John who was supposed to sign the ridiculous forged letter addressed to the emperors of Europe in 1165. That forgery inflamed Europe. Carpini, Rubruck, Odoric, all hoped to find this Prester John. Marco Polo thought he had found in the person of Ong Khan, one of the Karaits, the true Prester John.

In Henry's time the story in Europe grew that Prester John had been defeated in Asia but that he ruled a great kingdom in Africa which was a portion left from his original empire. So there appeared in addition to the Asiatic Prester John the figure of the African Prester John. He had a great throne-room in a cave at the head of a fountain which flowed out of the cave in two streams. One of these fed the Nile. Prester John controlled the flow of water and Egypt paid tribute to him so that he would not dry up the sources of the river or divert them. The other stream was supposed to flow westward through Africa and fall into the Atlantic. It was by this stream Henry's men were to reach Prester John.

Long after Henry, Prester John continued to influence Portuguese exploration. Pedro de Covilhão (Covilham) traveled twice to India and returning in 1490 heard at Cairo that Prester John was in Abyssinia. He went there and found, to be sure, that the kings of Abyssinia, though cut off from Europe, had been converted to Christianity since the 4th century. Covilham never succeeded in reaching home again. He lived and died in Abyssinia but he sent letters, and embassies passed each way. Later a whole succession of Portuguese visited Abyssinia—Goes, Paez, Father Lobo—but the truth about the country never reached the public. It was not until the 18th century when the English traveler, Bruce, visited Abyssinia that Europe knew the realities about the country. He at last laid the restless ghost of Prester John.



DIAZ AROUND THE CAPE OF GOOD HOPE, 1488

BARTHOLOMEO DIAZ DE NOVAES (ABOUT 1500)

WITH the death of Prince Henry the Navigator interest in exploration also died. For a number of years Portugal was occupied with other concerns. To be sure, ships went out to the Islands and to Africa and returned, but there was none of that pushing out to new territory that had made sailing under Prince Henry a stirring enterprise. It was not until King John II came to the throne in 1481 that progress was resumed. John II saw the value of Henry's work, and the long, long trail around Africa again saw the white wake of Portuguese ships and the style of a newer and freer kind of seaman.

One Bartholomeo Diaz de Novaes was the first and maybe the greatest of these. He was a seaman clear through. He came from a race of seamen, a relative of João Diaz who rounded Cape Bojador and Diniz Diaz who discovered Cape Verde. Others of our adventurers had other virtues, sometimes a combination of qualities that equipped them for enterprise. Henry was a scholar and an executive, Da Gama and Cabral were warriors and administrators as well as sailors. But Diaz preëminently had the gift of seamanship. He taught many of the men who came after him their sea-craft. We do not know much about his life—even the date of his birth is missing—but he seems to have had a genius for ships, and this is perhaps all we need to know.

He crops up in a record in 1478, a brief official record, that says he is exempt from paying on ivory imported from the Guinea coast. So from the very beginning we know he was trading with the outposts of Portuguese influence. In 1481 he is in command of one of the vessels sent to the Gold Coast under Diogo d'Azambiya. We lose track of D'Azambiya, but Diaz goes on. Five years later he is superintendent of the Royal Warehouses at Lisbon. The same year he receives payment from the crown in recognition for "Services to come."

"Services to come"—this sounds very gracious and liberal. As a matter of fact at the time the record is made Diaz has already left Lisbon with three ships on a mission to explore Africa. At 26° S. on Diaz Point he erects a landmark, part of which is still standing.

Still land to the east of him—an irritation to a seaman whose business it is to get on! He stands off to the south before half a gale and runs for thirteen days. This time he means to make a good job of it—there must be some end to this great lump of land! Given the sea and a good ship you can go anywhere, even through storms that rack and harry her and push her bluff breast into a smother of tough foam.

He holds on through a succession of gales. Far south he reaches the belt of westerly winds; the storms cease, and he turns east. There is good clear water here, and cold; perhaps he had better have a look at that shore again! On February 3, 1488, he stands into Mossel Bay. The coast seems to run east and west and it is his business to get eastward, so he works along as far as the place which he names "Great Fish River." But now the men are driven and weary and perplexed by a task that seems never to end.

They turn back and follow the coast line westward beyond the point at which they have picked it up. They swing a little south and find that they have come around a great cape which the commander names "The Cape of Good Hope." They have extended the known coast line by 1,260 miles. They have broken the back of Africa!

A seaman seldom knows how to claim his deserts and rewards ashore, and Diaz was no exception.

No rewards! Diaz shrugs his shoulders. But a seaman's work is never ended. He is ordered to superintend the building and fitting-out of the *ships that Da Gama is to take on a great expedition around Africa. Diaz himself is the natural choice to head that expedition. But who can cope with the arbitrary mind of a king? Thank God there are still ships! Diaz throws himself into the work with great energy.*

Hildebrand believes that Diaz's influence is to be seen in the design of Da Gama's ships, and that they had a moderate sheer and less clumsy superstructures than were usual at that time. Certainly the old captain's knowledge and experience were a great asset to the new commander, for he was the only man who had sailed the route past the Cape. He also knew the difficulties of weather encountered in running down the African coast. It is quite likely that he gave Da Gama advice about the advantage of standing well away from the African coast on the run south. Had he had his way he would have led that run himself. But he did not have his way. He was allowed to accompany the fleet only as far as the Cape Verdes. Here, with a sad heart and smoldering eyes he watched the fleet sail away southward in the hands of a commander who was riding to success and fame on a course he himself had laid down. Diaz was ordered to the Gold Coast, and went.

In 1500 Diaz was again helping another navigator on his way. He was with Cabral on the long bold run that carried the ships to the eastern tip of South America, and later took them in a wide sweep around the Cape. They weathered a twenty-day storm before four of the ten ships foundered. It is perhaps fitting that Diaz lost his life in taking Cabral around that one of the two great stormy capes of the world which he had discovered.

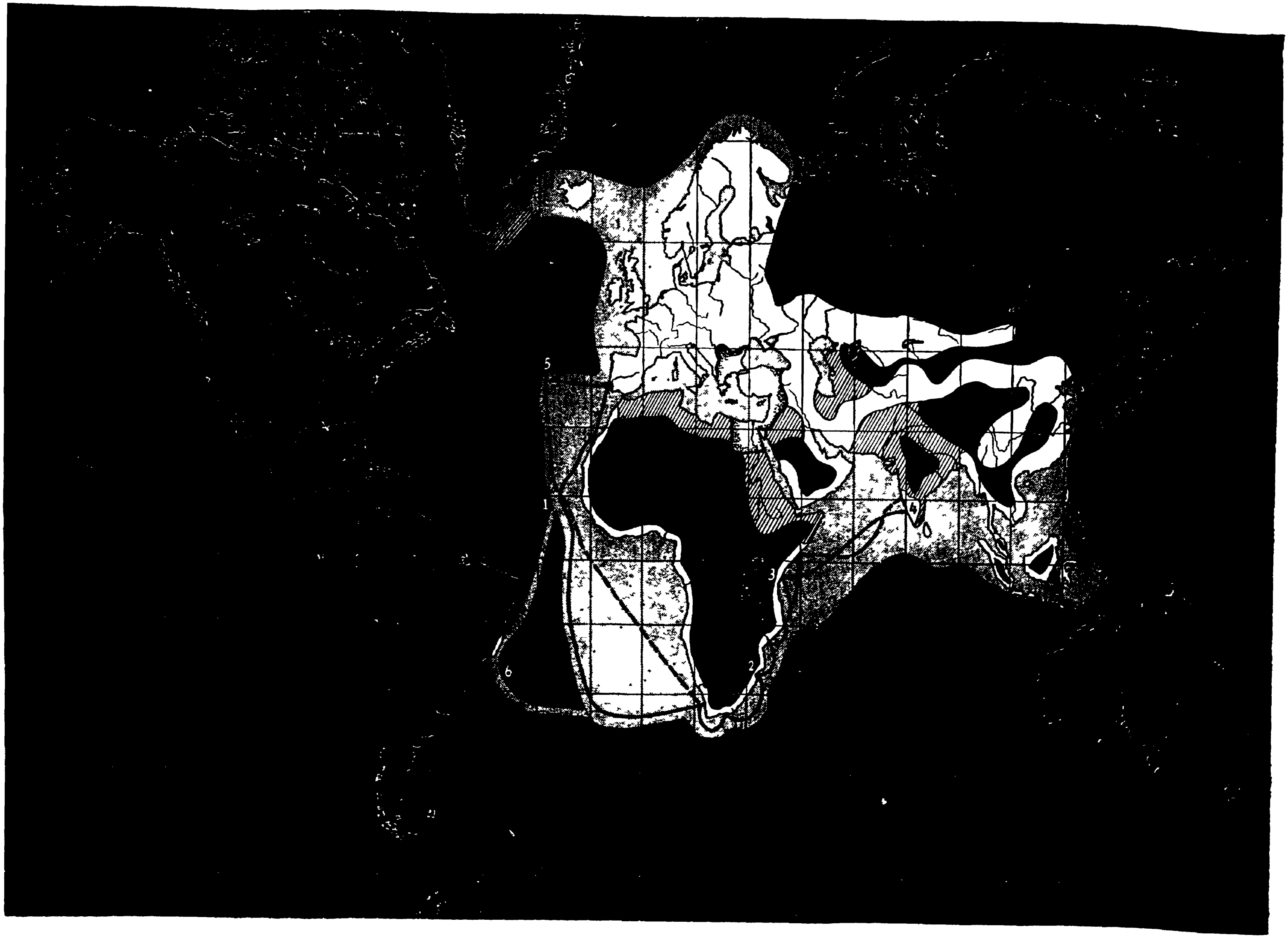
VASCO DA GAMA (1460-1524)

IT was Da Gama's fortune to turn romance into reality, to live what other men had dreamed, to put a cap-stone on a monument that had been raised by other hands. Da Gama moved with pomp and circumstance. He went to far and fabulous lands; he returned with power and riches. He was an explorer, but almost equally he was a warrior and a courtier. Not his the fate to be forgotten at Court as Diaz was forgotten, to suffer the humiliation that Columbus bore with dignity, or like Magellan to die a gallant and quixotic death amid the savages of a remote isle. He never took needless risks, he never accepted less than he deserved and he let no man forget him.

Da Gama was born in Sines. His father was governor of the Province of Alemtejo. As a young man he entered the service of the Court and the army and early gained an experience in navigation and the management of ships. But he did not make the mistake of going on too distant voyages; he was present at the Court while Diaz was making his casts down the African coast and around the Cape. When the King decided to follow up Diaz's discoveries, Da Gama was present, waiting only for an order to start.

The order comes to him in the spring of 1497. He is given four ships, including the "São Raphael" and the "São Gabriel," vessels built under the direction of Diaz, each of about 120 tons. And also the "Berrio," a 50-ton caravel, and a small ship for stores and supplies. One hundred and seventy men are to man this fleet. He is also given the assistance of Diaz and his pilot, Alemquer. He is ordered to sail "for India."

By July 7th all preparations have been made and the fleet lies in the Tagus before Lisbon. The interest of the kingdom is focused on this voyage. In the evening, lights shine from the hills about the harbor and, accompanied by their



VASCO DA GAMA TO INDIA, 1497-1499

Route out: solid line. Return: broken line. (1) Cape Verde Islands. (2) Delagoa Bay. (3) Mombasa and Malindi. (4) Calicut. (5) Azores. (6) How Cabral and Diaz started for India and discovered Brazil.

families, the departing mariners troop to the shore. The admiral and captains, as befits their state, attend a service at the chapel at Belem. Mass is said, oaths taken, prayers offered. The vigil lasts all night, and in the morning, to the sound of martial music and with banners flying, they sail.

Twenty days later they are in the Cape Verdes. From there they follow the coast as far as 10° N. and then, to avoid the fitful weather of the Guinea coast, make their great arc through the South Atlantic, which carries them within 600 miles of the American shore. It is November 7th before they sail into St. Helena Bay. Here they encounter the Hottentots and relations are first attended with friendliness and amusement on both sides; but the inevitable misunderstanding arises. Da Gama is slightly wounded by a native spear. By the end of the month they have doubled the Cape and come in on Mossel Bay. The little store-ship has received rough treatment; she is broken up and her contents transferred to the other vessels. Natal is so named because they reach it Christmas Day. And they pass on to the Zambesi, which they call "The River of Good Tokens" because here they hear of prosperous lands to the north. They are off Mozambique in April, and then on to Mombasa and to Melinde.

They are now well in the territory of African and Indian trade and on the coast where Arabic is the trade language. Vessels come and go bearing objects of gold and silver in outlandish shapes and rich textiles. They find a hospitable reception at Melinde and secure the services of a Moorish pilot from Guzerat, who is to guide them to India. But they must wait three months for the monsoon.

Then they put to sea, skirting the coast of Abyssinia. Before a steady breeze from the southwest they set a northeast course and hold it steadily for 23 days. They pass to the north of the Lacadive Islands, and on May 22nd come to anchor in Calicut on the Malabar Coast of India. They have been 10 months and 14 days out of Lisbon. At last Portugal has a trade route to the East!

But to have a trade route is not the same thing as to have trade. Da Gama learns to his surprise that he is not altogether welcome on the coast and that the East has its own way of doing business. There is every evidence of business to be done—rich palaces, ornate temples, jewels worn by princes, plate of precious metals, rich cloths and plain cloths, some called calico after the place—and everywhere the dense, restless population. But no trade! That is in the hands of the Moplahs—Mohammedan traders, warlike and fanatic—who terrorize the native ruler, the Zamorin. Hedged about with the swords of the Mohammedans and with guns of Da Gama's ships looking steadfastly at his palace the life of the Zamorin is not a happy one.

He loses his head, invites Da Gama ashore and tries to hold him captive in his palace. The fleet seizes hostages and threatens death and destruction to the port. Da Gama is released and proceeds to develop trade here and at the city of Cananore where Mohammedan influence is less strong. That move of the Zamorin is to cost India something.

Finally the ships turn home with a store of goods and some captives and a heavy cargo of tales of the fabulous East. There is a stop at Melinde to keep alive the contact and influence established there. Twenty-six months after the ships have started out, they drop anchor again off Belem. The Captain-Major appears before King Manuel with many vessels of gold and silver and an idol of gold weighing 60 pounds, with emerald eyes and a ruby as large as a walnut in its breast.

Da Gama moves through the streets in triumph, surrounded by throngs of shouting citizens. In the taverns his mariners regain their strength and tell long stories of the wealth of Malabar and the hatred of the Moors. The little kingdom is electrified with pride and hope. The King writes to his father-in-law, Ferdinand of Spain, and to the Pope an account of Da Gama's discovery, and signs himself "Lord of the Conquest, Navigation and Commerce of Ethiopia, Arabia, Persia and India."

Cabral takes a large fleet to India in 1500 but meets with losses and reverses. He is about to start again when Da Gama, working on the King and Court, takes this command from him. Da Gama claims vengeance on Calicut, sails to India for another two years and terrorizes the coast in as bloody and brutal a series of raids as history records. Ships are fired, men, women and children burned alive; bodies of dead and living are mutilated; Calicut laid waste.

When he returns home, trade has been reestablished under the muzzles of guns. Da Gama retires with great honors; his revenues from India make him the wealthiest man in Portugal.

But Malabar remains a perilous way from Lisbon, and the methods of conquest and plunder are in the long run at war with the methods of colonization and trade. After some years, rumors of reverses and inefficiencies and scandals reach the Court of Lisbon. It is 1524 when Da Gama, now a man 63 years of age, comes down from his estates to the Court and as Viceroy of India sets out again to reëstablish the power at Cochin. With dignity and no diminution of his power in handling the fleet, he makes the long voyage successfully and sets up his rule on the coast. But after two months he succumbs to the country he has conquered. In pomp and with public mourning, his body is brought home to Lisbon to rest in the chapel at Belem that had been built for the use of seamen by Henry the Navigator.

PEDRO ALVARES CABRAL (1460-1526)

CABRAL made an independent discovery of the South American continent. Whether this was one of the discoveries due entirely to fortune or whether it was due to crafty but concealed design is difficult to say. What Cabral himself said was that he was on his way to India. He was blown a little out of his course and came on South America. This was in the spring of 1500.

Now that is not an unreasonable story. We have seen that Diaz and Da Gama were learning already that the best route around Africa for sailing ships lay well to the westward and a glance at the map shows how far the eastward bulge of South America reaches toward the Canaries and the Cape Verdes. Diaz was sailing with Cabral and he had had years of experience in African voyages. The systems of winds and currents in the upper part of the South Atlantic both move westward. A storm could quite easily set him on the South American coast.

On the other hand several scholars have pointed out that there are old maps made by the Portuguese which show their belief in, and possibly their knowledge of, tracts of land in about the position occupied by South America. It is also known that the Portuguese from the time of Henry the Navigator on were very secretive about some of their discoveries. It is just possible that Cabral deliberately set out to discover or to rediscover South America.

In any event Pinzon had reached the South American coast below Cape St. Augustine earlier in the same year. But Cabral did not know this. He separated a ship from the fleet and sent it at once to Portugal to announce his discovery for which he is usually given full credit. In fact the eastward point of South America lay in territory that had been assigned to Portugal by the bull of the Pope and by the Treaty of Tordesillas. But the discoveries of Cabral and of Pinzon falling within a few months of each other launched a rivalry between Spain and Portugal and started feuds and warfare that raged in South America for many years.

All of Cabral's good fortune came in the beginning of his trip. He had started out in March of 1500 with a fleet of 13 ships and 1,500 men. His purpose was to repeat Da Gama's voyage to India. So he left South America and headed for the Cape of Good Hope. On the way around, five of his vessels were sunk in a terrific storm. One of these was the vessel of Diaz who went down with his ship. The surviving ships Cabral took to Ceylon where he traded successfully and came back with riches. But he won no favor with King Manuel. The loss of the men and the ships was remembered and rumor was circulated that Cabral was unlucky. Seamen and kings are tenacious in their superstitions. Cabral retired to private life and died in 1526.

Cabral, Almeida and Albuquerque—these are the last great names among the Portuguese seamen. The King had refused the services of Columbus, he was to lose the services of Magellan. Leadership in the great adventure passed to Spain.

A Note on Portuguese Navigation

THE success of Portuguese navigation depended in great measure upon the genius of Henry the Navigator, and the captains he inspired and supported. But we should not forget that early Portuguese and Spanish navigators were assisted also by certain simple physical conditions.

Along the Portuguese coasts and the southern part of the Spanish coast there is a system of augmented winds which blows from the northeast through a fair portion of the year. Off this southern promontory of Europe there runs also a perceptible southerly current. These winds are known to navigators as "Portuguese Trades." The current at its southerly end merges with the North Equatorial current. Together they are part of the great clock-wise cycle of winds and currents that sweep around the North Atlantic Ocean and that give it its special organization and structure. It is true that strong westerly gales occasionally sweep down on the Portuguese and even Spanish coasts and interrupt both the winds and the currents. But in settled weather these must have been a great asset and encouragement to the early navigators. These favorable influences would be much more important to the early and relatively clumsy ships which could make little if any progess to windward than they would to sailing vessels as we know them today.

With fair weather established and sail well set, the Iberian vessels were in the grip of favorable influences which tended of themselves to carry them to the Atlantic islands and to the African coast as far as Cape Verde.

But on reaching the latitude of Cape Verde a completely different set of circumstances is encountered. Here we run into the storms, the sudden squalls, the heavy rains and the dead calms of the Doldrums and the uncertainties of tropical weather generally. The extent of these weathers is also greater near the African shore than it is well out to sea between Africa and South America.

The exploration of the southwest African coast was attended also by unfavorable circumstances. Here the winds through a large portion of the year blow from the southwest and tend to parallel the coast line. The early vessels worked south against head-winds with great difficulty. Port tack lost them their bearings with the land and starboard tack drove them ashore. So the logical course for a ship rounding Africa was to stand well off to the southwest until latitudes were reached where a system of prevailing westerly winds carried the vessel naturally around the Cape.

Now Bartholomeo Diaz in his lifetime built up an experience with all these weather conditions. It seems to me quite likely that it was largely owing to his knowledge of the natural wind-systems on which the South Atlantic is organized that the vessels of his own expedition as well as those of Da Gama and Cabral laid such intelligent courses—and on the whole met with such success in getting around the Cape.

Up to the time of Diaz nearly all voyages of exploration were in effect coasting voyages, the ships following the shore from point to point. Even the Norsemen had to face only relatively short ocean passages. Diaz was showing unparalleled courage and judgment on his first sweep around the Cape. Da Gama, after he left the Cape Verdes, ran 4,500 miles before he picked up land again at St. Helena Bay. Columbus's probable first course to the West Indies covered only 2,600 miles. It is little less than extraordinary that such long and intelligent courses should have been laid so soon after men first began to dare the open ocean in ships. This quarter of a century really marks the beginning of deep-sea navigation.

The compass seems to have come into use in Europe around the 12th century. It was found first among the Genoese and Phœnician sailors who were trading with the Saracens and other eastern peoples. But the first reference to a compass in English literature is by a man named Alexander Necham of St. Albans (1157-1217). He describes clearly a well-developed instrument and this seems to dispose of the claims that the Chinese were the discoverers of the compass.

The first early European compasses were often referred to as "Genoese needles" and at the start they were little more than small magnetized metal bars. But soon they were mounted over cards that had wind-roses painted on them and a recognizable form of our modern compass began to take shape. The compass gave European sailors a new sense of security and freedom. They were no longer dependent upon landmarks. The Portuguese sailors were among the first to use the compass in long runs offshore.

SPAIN

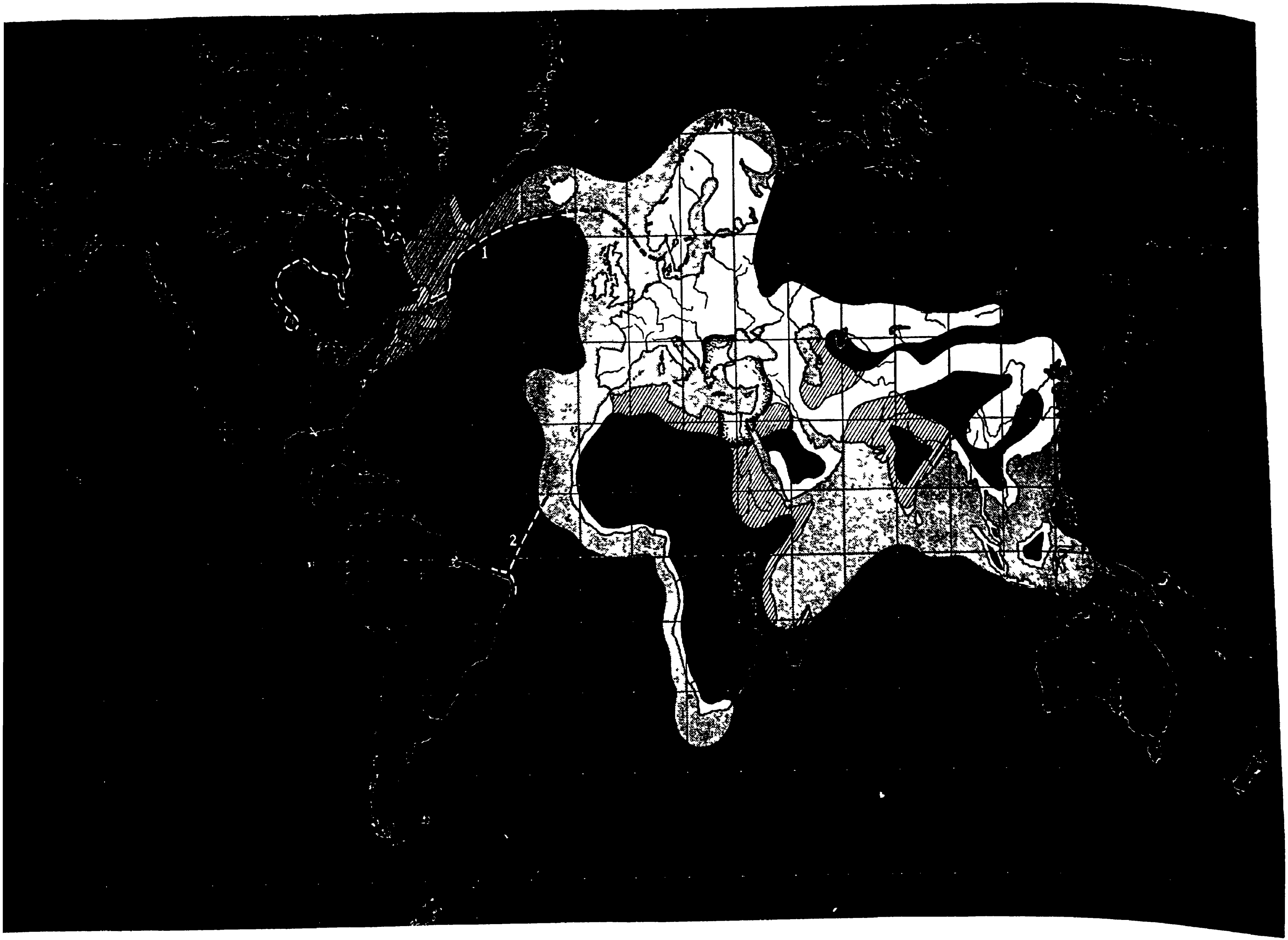
CHRISTOPHER COLUMBUS (1451-1506)

"IN 1492 Columbus discovered America."

When I was in school I was allowed to say that, and I suppose there still are countless Americans who would accept it as true. Yet there are not many sentences of so few words which contain so many misleading ideas.

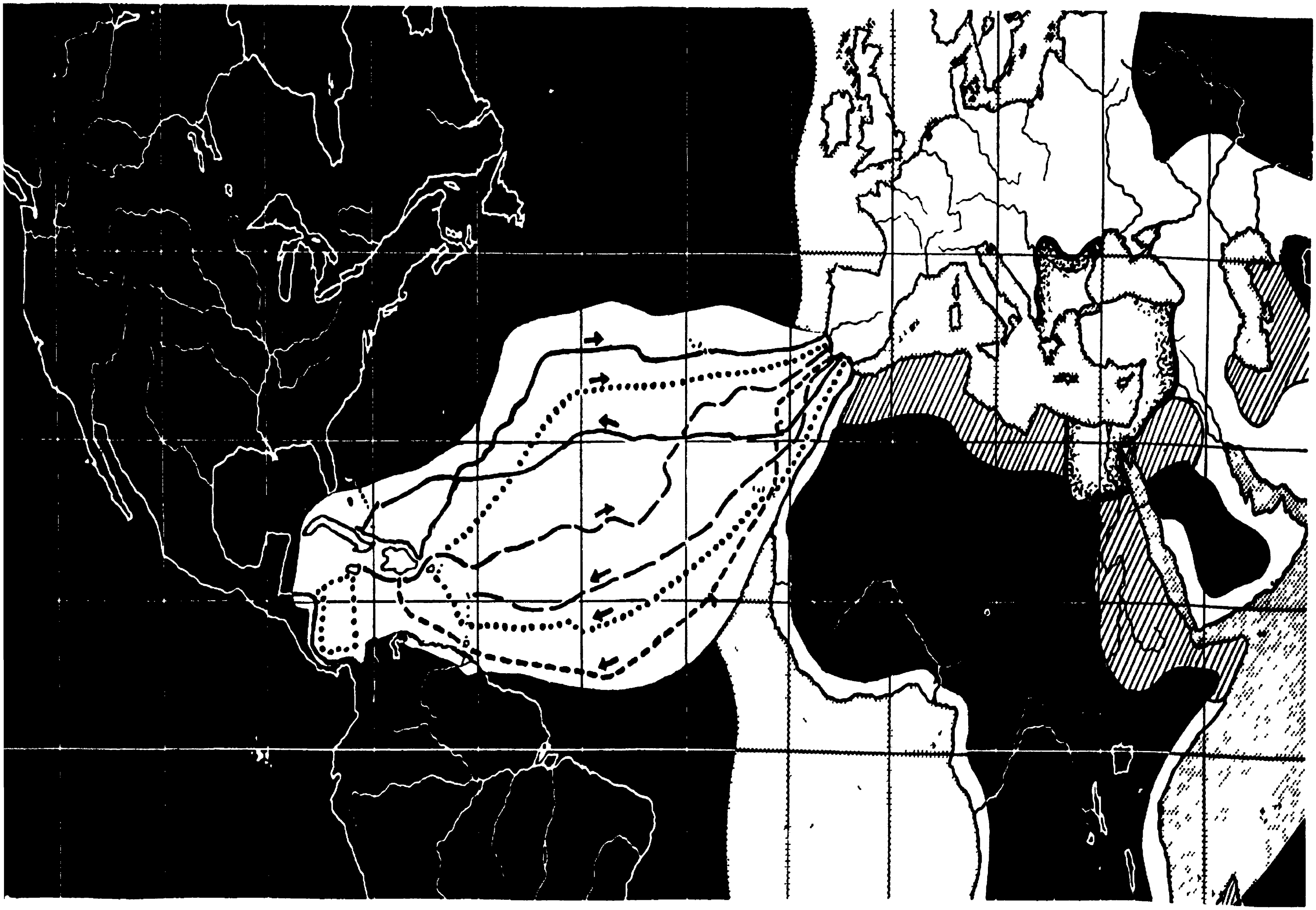
In the first place, we know that Columbus was not the first man to reach the American continent. We know definitely that a number of Norse explorers had reached the continental land mass of America in the 11th century and left records of their voyages. How many expeditions came without leaving records, we cannot conjecture. We know also that there is a probability that a number of other ships had at one time or another come across American islands or parts of the American mainland. There is the evidence of the old map of Bianco, which indicates that a Portuguese expedition sent by Henry the Navigator may have reached the American coast as early as 1440. Then there is the evidence that Professor Sofus Larsen has produced regarding the combined Danish and Portuguese voyage to Newfoundland in 1472-3. Finally, there is the possibility, suggested by Professor Vignaud, that Columbus himself in Madeira, about the year 1484, had talked with a Portuguese pilot who had sailed westward to some islands and returned.

Even if we reject the claim of all these expeditions except that of the Norsemen, it still would not be true that Columbus discovered America in 1492. What he did on this occasion was to sail to Watling Island in the Bahama group. From there he proceeded in a southeasterly direction, discovering other islands in this group, and finally reached Cuba and Hispaniola (Haiti-Domingo). It was not until his third expedition that Columbus even saw any part of the American mainland. By this time, Cabot had sailed from Bristol in England and reached Newfoundland in the year 1497. In 1500 Pinzon had sailed to the mouth of the Amazon and Cabral and Diaz had touched the eastern extremity of South



THE WORLD IN 1490; JUST BEFORE COLUMBUS

(1) The problematical voyage of the Dutch and of João Corte-Real. (2) The problematical voyage of the Portuguese under Henry the Navigator.



THE FOUR VOYAGES OF COLUMBUS

1st Voyage, 1492 ————; 2nd Voyage, 1493 —— ——; 3rd Voyage, 1498 - - - - - -; 4th Voyage, 1502 . . . .

America, that is, Cape St. Augustine, on their way to India.

Also in 1492 and the years that followed Columbus was far from thinking that he had discovered America. He had no intention of discovering America and even in later years, as the evidence of other explorers began to pile up around him, he still hoped that he was simply making his way through some large islands.

Why then did Columbus sail? What was he looking for? What were the ideas that took him westward? The agreement drawn up between Columbus and his sovereigns is somewhat vague on this point. "For as much as you, Christopher Columbus, are going by our command, with some of our ships and with our subjects, to discover and acquire certain islands and mainland in the ocean . . . it is a just and reasonable thing that . . . you should be rewarded for it." What islands? What mainland? Columbus' journals do not clear this matter up.

But the old globes and charts showed islands in the ocean between Europe and Asia, that is, in about the position which the West Indies and the American continent actually occupy. These islands were there for two reasons. First, there were mythical islands left over from the classical world—"Fortunate Isles," "Atlantis" and "Ultima Thule." To these the medieval world added further myths about "St. Brandan," "Antilia" and others. It was as difficult for the human mind to think of an ocean without islands in it as to think of space without a boundary. Second, Polo and other eastern travelers spoke of the great number of islands that lay beyond Asia. The European geographers hardly knew what islands they were or in which direction they extended but conscience compelled them to show a liberal smattering of them in their maps.

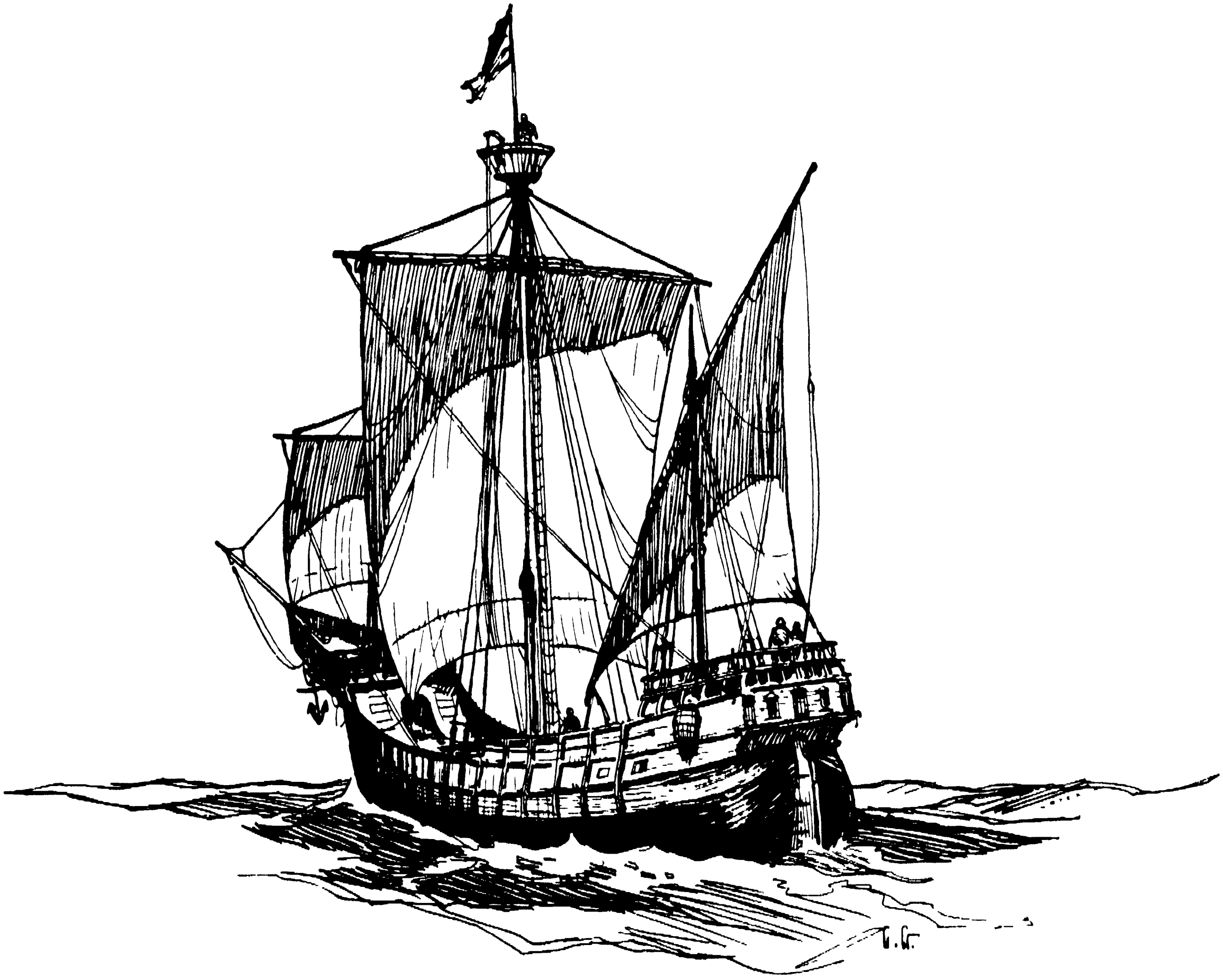
On the other hand, no map and no legend expected in the western world a continent dividing two great oceans. It was natural, therefore, for Columbus when he returned home from his earlier voyages to report simply that he had found islands. They were on the way to the Indies, so he referred to them as the "Indies," probably using this term in a very general sense. It followed, of course, that the natives were Indians.

Columbus' intention then was to find for Spain, by sailing westward, a route to either India or to the island of Cipangu (Japan) which Marco Polo wrote about and which Kublai Khan had been unable to capture. His secondary object was to claim for Spain any islands that might lie along his course. These would make convenient ports and stations on the western route to the Indies, just as the Canaries and the African ports made stations for the Portuguese.

Columbus found only what he expected to find before he sailed. No map and no legend spoke of a continent dividing two great oceans. So Columbus admitted none—he found simply islands.

The latter voyages were attempts to find a passage to India, not to explore the lands he had already discovered. At the bottom of his heart he seems never to have been particularly happy about the beautiful islands and great land masses that he came upon. He sailed right between Trinidad and South America, past the mouth of the Orinoco and the mountains of Venezuela, with hardly more than a glance at this continent. He was not a dull man and he knew that a river of such size as the Orinoco implied the existence of a great land mass. Yet he sailed on and never returned to the spot. His next voyage brought him to the Central American coast. He was always trying to get through this land. There was no point to it, it wasn't India!

Even on his fourth and last voyage when Columbus picked up the coast of Central America and sailed along toward Panama, he was not convinced that these coasts were in themselves im-



COLUMBUS'S SHIP

NO one knows the exact individual plan of Columbus's flapship, "Santa Maria." But we know that most of the current paintings, drawings and models of the "Santa Maria" give a wrong impression. They are based on incorrect drawings and reconstructions created at the time of the Chicago-Columbian exposition. They show a vessel of a type which did not develop for a hundred years after Columbus.

Gordon Grant's drawing shows a vessel which he believes, after long study, is characteristic of Columbus's time—just such a ship as the navigator would be likely to secure for his daring venture. Note the round stern, the relatively simple deck structure aft, the simplicity of the sail-plan. It is likely that the "Santa Maria" did not even carry a main-topsail, and she is shown here without this feature.

Note that the raised structures forward and aft have now become a permanent part of the ship and that this is the first of our European vessels shown to have a large vertical rudder permanently attached to the stern.

portant. But he brought back a legend of a country lying to the west called Veragua. This country was very wealthy and contained much gold. It must, thought Columbus, lie somewhere near the River Ganges. By the time of his return from his fourth voyage Ojeda, Pinzon, possibly Vespucci, and Columbus himself had sailed for hundreds of miles along the coast of Central and South America. He died in 1506, apparently preferring to believe that a ship would presently find a way through these annoying islands and in a day or so come sailing in to Cipangu or India.

Columbus led the way to the new world so we have come to think of him as a modern-minded man. We need recall only two incidents to remind ourselves how far this was from the truth.

First, during his second voyage Columbus made everybody in his company swear that they were sure that they had arrived in Asia. He had already had experience with doubters and skeptics who could not reconcile these coasts with the pictures they had already formed of Asia. And Columbus himself, must he not have had doubts which he wished to dispel? He sent his notary with four witnesses to every man in the fleet and had each man sign an oath that he had no doubt as to their arrival at the coast of Asia. If any man later denied this statement, he was to have his tongue slit; further, if he was an officer he was to pay a fine of 10,000 *maravedis;* if a sailor, he was to receive 100 lashes. The document is dated June 12, 1494, and is, according to John Fiske who quotes the document, still preserved in the Archives of the Indies at Seville.

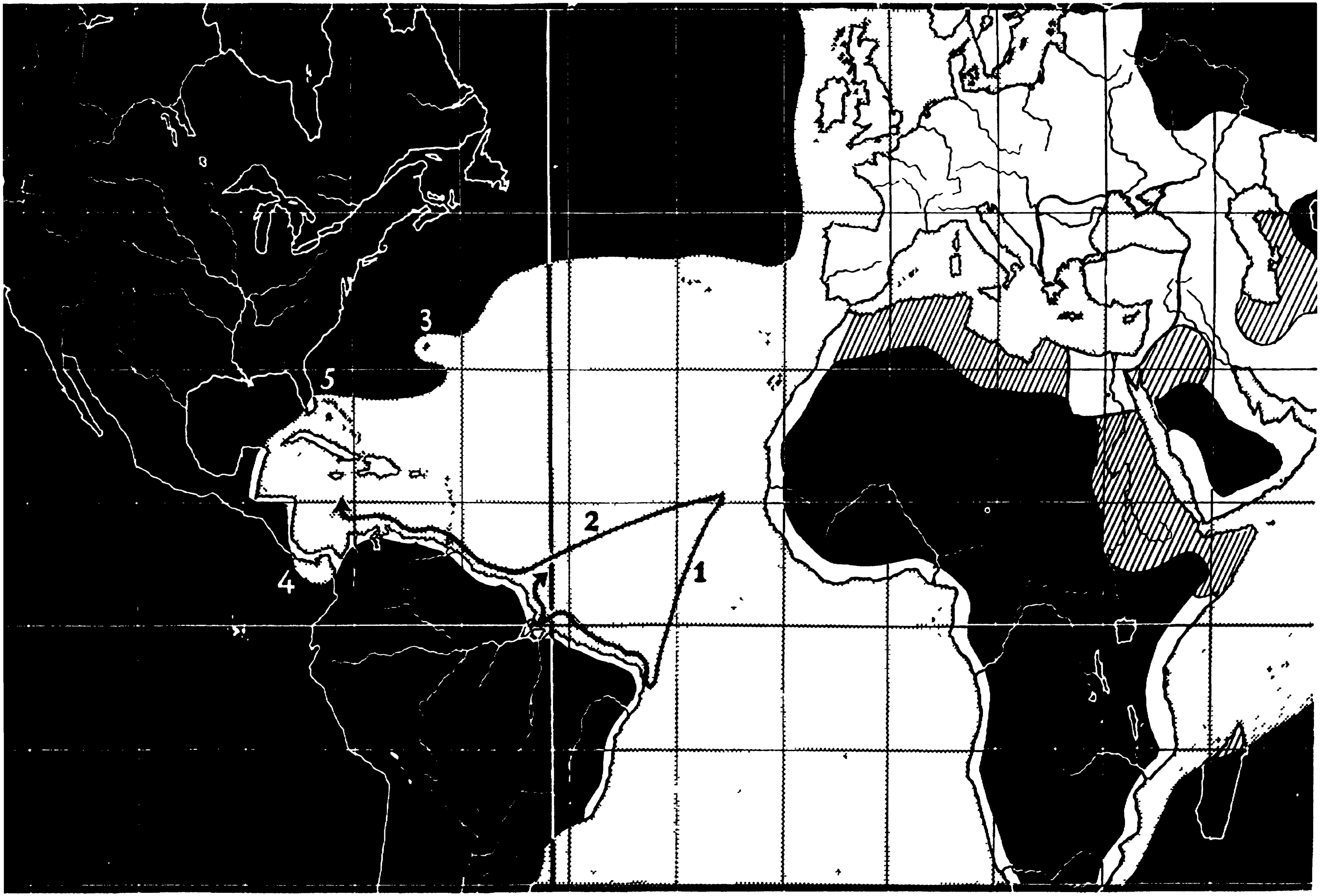
Second, in a letter intended for the Queen, Columbus describes his reflections and feelings as he sails by the mouth of the Orinoco on his third voyage. He has had a difficult passage and now is held back by the turbulence of the river waters which mingle with the salt water at sea and which hold him back. He has the feeling that he is sailing uphill. He develops the idea that the world though roughly round has a bump or elevation on it. We can picture this idea by imagining that the world is pear-shaped. At the top of the elevation is Paradise. Columbus does not believe it is possible for any man to reach this elevation. He will, however, explore the regions round-about and report to the Queen. These and other passages show how science and theology mingled in his mind.

The clearest thinkers of his own day were ahead of Columbus. But he was a great practical voyager. Even if we accept the fact that others had preceded him to American shores, we may still say that he publicized the westward passage much as Lindbergh publicized the flight to Europe, though a number of flyers had preceded him.

We must judge Columbus not only by the land he discovered or failed to discover, but also by the amount of navigation he carried out at sea. His combined ocean tracks covered a broad band of latitude through the Middle Atlantic. It has been charged that he made some slow passages and therefore that he was not a skilled navigator in the use of the trade winds and the westerlies. On the contrary, there seems good reason to believe that his choice of passages was deliberate, made with the intent of exploring the ocean and falling in with new lands in the ocean if such existed. Though no such lands were found, Columbus' investigation of the Atlantic passage should be reckoned one of his great accomplishments.

After Columbus

COLUMBUS was great, not only by reason of what he himself did but also by reason of what others were inspired to do, once he had



AFTER COLUMBUS TO 1515

(1) Pinzon to South America and the mouth of the Amazon, 1499. (2) Ojeda, Cosa and Vespucci, 1499 (3) Bermudez to Bermuda, 1515 (4) Balboa to the Pacific, 1513 (5) Ponce de Leon to Florida, 1513

Demarcation line of the Treaty of Tordesillas, 1493. The Portuguese were to control discoveries east of this line, the Spaniards, to the west shown them the way. In the first score of years of the 16th century a whole fleet of ships spread their tracks fan-wise over the western seas. Countless new islands were discovered and the coast lines of the American continents about the Caribbean linked together. Many of the leaders of these expeditions were men who had sailed with Columbus.

Among these was Alonzo de Ojedo who in 1499 reached the South American coast at Surinam, discovered the Gulf of Venezuela and, after exploring it, penetrated to Cape Maracaibo.

In 1500 Vicente Yañez Pinzon (about 1460-1524), who had sailed with Columbus as commander of the "Nina" sailed still farther south. A member of an important and wealthy Spanish family, he was one of three brothers who had sailed with Columbus and who had contributed toward the support of his expedition. Anxious to make discoveries of his own, he fitted out an expedition and set sail in December, 1499. By January, 1500, he had picked up the South American coast a little below Cape St. Augustine, thus making the first discovery of Brazil. Cruising northward, out of sight of land, he suddenly noticed a difference in the color of the water. He sampled it, found it was fresh and good to drink. Needing water he filled his casks at sea and sailed on. His curiosity was aroused and he decided to find out where this extraordinary water came from. He followed the current up until he came to islands lying in the river mouth. Thus he entered the river which we now call the Amazon, but which he called simply Mar Dulce, The Freshwater Sea.

Then Pinzon wisely decided that the currents and tides made it a dangerous place for his ships and he soon left. But he unwisely took just time enough to make a raid on the natives and carried away with him 36 prisoners. The banks of the Amazon at that time were lined with Indian villages and great fleets of canoes moved across it from shore to shore. It is probable that Pinzon's raid may have been in part responsible for the bitterness and hostility with which the Indians met many later explorers and was undoubtedly the cause of the savage attack on Diego de Lepe who sailed into the river a short while after Pinzon.

In this same year Alonzo Nino sailed to the island of Margarita, off the northern coast of South America, and westward of this point touched the South American coast, while Rodrigo de Bastidas, in search of gold and pearls, explored from the Gulf of Maracaibo to the Gulf of Darien, thus completing the discovery of the northern coast of Brazil.

It is strange that with so many long and authentic explorations taking place at this time, the name of an obscure ship-chandler, all of whose voyages have been called into question, should be attached to the American continents. This was Amerigo Vespucci (1451-1512) who claimed to have made four voyages: in 1497, 1499, 1501, and 1503.

His claim to fame as an explorer rests almost entirely upon his own letters and is largely uncorroborated. Had he made the voyages which he claims, their combined length would have exceeded the total navigations of Columbus, and his scope in latitude would have run from 73° S. to 40° N. He claims to have sailed past thousands of miles of American coast, yet he mentions only three or four specific place names and these are impossible to identify.

On his first voyage he claims to have discovered what is now the coast of Mexico and to have sailed northward along the shore line of the Gulf of Mexico until he had come to the southeastern part of the United States; that on his second voyage he struck the South American continent south of the equator and thus discovered Brazil before Cabral's chance landing in 1500 and Pinzon's discovery. His third voyage, made for the King of Portugal, followed the South American coast line from just below the equator southward, possibly as far as the island of South Georgia, "13° from the antarctic pole," according to Vespucci's own words. His fourth voyage also was to the South American coast and seems to have failed there.

Today, after centuries of debate, nobody can say with certainty whether these voyages were the products of a lively imagination or whether, as seems most likely, they were partly true and partly false. But it is significant that Vespucci's name is almost unknown and unmarked in the official annals of the Portuguese and Spanish for whom he is supposed to have sailed.

But there is a thin trickle of justice in the historical accident that attaches his name to the western world, for, while Columbus and most of the other Spanish pilots spoke only of islands and isolated land masses, Vespucci's writings call attention to great lengths of coast line lying in the general position which the western continents occupy. In 1507, Martin Waldseemüller, a German theoretical geographer, published a map in which he assigned to a southern land mass in the western world the name America, taken from the Latin version of Vespucci's first name.

But in a new map of 1513, the name America had been removed and the land mass was labeled simply *Terra Incognita.* The Caribbean shore of South America had an inscription that read like this: "This land with the adjacent islands was discovered by Columbus of Genoa by order of the King of Castile." Apparently Waldseemüller had very rapidly changed his mind as to the importance of Vespucci's discoveries and his letters, but in the meantime the name had been repeated, had caught on, and has stuck ever since.

Fame came to Vespucci during his lifetime, but it eluded Ponce de Leon, who sought it so strenuously. Ambitious, restless, energetic, he had served in various campaigns against the Moors of Granada, had accompanied Columbus on his second voyage and had resented and finally rebelled against his authority. He was apparently a capable man, spoiled by ambition and envy. He governed Porto Rico so savagely that the Indians revolted and the King recalled him. He came to his own explorations so late that his best judgment and energy were already waning.

Saddened, he looked about for new work. It was a wide world in those days! Surely there must be lands beyond, undreamed of by Columbus! There were old Indians who talked of Bimini, a rich land to the north. There was gold there and, better yet, a river that restored health and youth. To one no longer young, yet full of ambition, that had an alluring sound.

At his own expense he fitted out three ships and manned them with adventurers. There was no difficulty about that. One had only to select a crew, for in those days there were men in plenty ready to sail anywhere at the drop of a hat, if only there was talk of gold or the promise of new lands!

In March, 1513, they set sail in three ships from Porto Rico, and, sailing north, came to the Bahama Islands. After visiting the islands, they sailed on, arriving at San Salvador. Here they looked for the Fountain of Youth and, sailing on, picked up a coast in the west about latitude 30°. It was Palm Sunday in April and even from the ships they could see the trees and flowers in bloom. Ponce de Leon landed, took possession of the land and christened it Florida. But again there was no evidence of gold and no fountain of youth and the Indians were far from hospitable. Disappointed, he turned homeward and, after some difficulty in navigating the Bahama banks, reached Porto Rico, older, poorer but not necessarily wiser.

Later he returned to Spain, was made governor of Bimini and Florida, as well as of Porto

Rico. He returned to Porto Rico but ruled with such great severity that the island smoldered in discontent. Again jealousy and ambition stirred him, but this time it was the accomplishments of Cortés of which he was jealous. Cortés had found a vast and wealthy land and had conquered it. Why should not this Florida, which he, Ponce de Leon, had discovered, prove equally vast and equally wealthy? Let the ships be manned once more!

In 1521 he embarked with two vessels. It was a tough, stormy job at the end of a tough, stormy life. There were gales and difficult, narrow seas with dangerous currents; there was a bloody fight on the low shores of Florida in which comrades were slain, and at the end a wound in the thigh instead of healing waters. Wounded, ill and broken in spirit, the discoverer of Florida and conqueror of Porto Rico was carried back aboard and was dead even before the ships could anchor safely in Cuban waters.

But the Spanish adventurers continued and among other discoveries was the accidental one of the island of Bermuda by Juan Bermudez, who was shipwrecked here in 1515 while on a voyage from Spain to Cuba with a cargo of hogs. By 1518 Spaniards had explored the coast from Panama to Cape Blanco, making their return overland, and by 1519 Alvarez de Pineda had connected the Florida that Ponce de Leon had discovered with the country that was already known as Mexico; and the name Florida was applied not only to the peninsula but to all the north shore of the Gulf of Mexico.

Pineda had sailed in 1519 along the west coast of Florida northward, had followed the Gulf coast westward past the region that is now Texas and had advanced well into Mexico to the Pànuco River. Here he had come into contact with Cortés, who protested that his territory and rule were being interfered with, so Pineda turned back and on his voyage stopped by a river to which he gave the name "Rio del Espiritu Santo."

This was probably the first visit of a European to the Mississippi and the first mention of the river. Pineda believed that this might be the strait which would lead to the Indies but found that it did not lead him westward. His voyage, however, showed the great length of the coast line and the Spaniards now turned their attention to the eastern coast of Florida and by 1526 had reached as far north as Chesapeake Bay.

By then very great discoveries and conquests were under way.

VASCO NUÑEZ DE BALBOA (1475-1517)

HIS name in the Spanish records is Vasco Nuñez but he is famous in the English-speaking world as Balboa. His family were gentlefolk but poor. Little was known of him until 1501 when at 26 years of age he sailed with Bastidas on a western voyage. Bastidas was moved by Columbus' reports of wealth in the New World and set out for the western shores of the Caribbean. But they were shipwrecked on the coast of Española and Balboa, who was stranded there, took up the life of a farmer. By 1510, he was in debt and anxious to escape from his burdens.

Encisco was fitting out an expedition to sail to the settlement called San Sebastian which Ojeda had established in the Isthmus of Panama. Balboa, clad in rusty mail, clutching his sword and accompanied by a dog, hid himself in a cask among the provisions until the ships were at sea. Then he stepped out on deck and was promptly imprisoned by Encisco. Thus began a quarrel between these men that followed Balboa through all his great works and brought about his downfall. On the pleas of other adventurers, Balboa was finally released and allowed to join the company.

They found Ojeda gone and his town in ruins. Balboa persuaded Encisco to sail for Darien and to establish a new town there. The settlement was established but quarrels and jealousies broke out among the adventurers and in these quarrels Encisco fared badly, for he was not a capable leader. On the other hand Balboa's authority increased, for he showed himself brave and courteous and was on the whole kind and just in dealing with the natives. The settlers finally deposed Nicuesa, one of the rival leaders, and sent him off to sea in an ill-conditioned vessel. Balboa then arrested Encisco on a pretext and shipped him back to Spain.

Balboa commenced conquering the surrounding territory. Forty leagues from Darien in the country of an Indian chief called Comogre, Balboa heard of a distant sea and of a country abounding in gold and pearls. He was told that to reach this land he must cross the mountains and sail the sea and come with a company of at least a thousand men, for the people were powerful and warlike.

The effects of this meeting were far-reaching. The Indian chiefs, who held power by reason of their courage and skill, and who were accustomed to despise possessions, were amazed to see the strangers squabbling over gold. It was with a feeling of disgust that Comogre's people told the Spanish leaders about the metal that reduced them to such a childish state of excitement. But the interview set Balboa looking for the sea and it was probable that Pizarro heard here the first of the many rumors that finally led him to Peru.

Balboa returned to Darien and here he found letters from Spain saying that Encisco had complained against him to the King. Balboa thought he could reëstablish his reputation by discovering and conquering the fabled country in the west and so he planned a great enterprise.

In September of 1513 he set out with 190 Spaniards and with 1,000 Indian followers, servants and slaves. They labored and sweated through the deep jungle, crossing incredibly rough and mountainous country. After many hardships, on September 25th they saw before them the summit of a bald hill from which the Indians said they could look off over the sea. Balboa climbed upward while the men behind him waited in silence. At the top he stood still for a moment and then dropped on his knees in prayer. The men rushed forward and wept and shouted, for below them lay the Bay of San Miguel and beyond stretched the great body of water that Balboa named the "Great South Sea." They built up piles of stones and fashioned rough crosses of wood. There was no doubt in their minds that they had in truth made a great discovery and that magnificent countries and conquests lay before them.

They began a descent of the Pacific slope and by the 29th Balboa had waded out into the ocean holding up his sword and taking possession of the sea in the name of Spain. Again they heard of a wealthy country to the south ruled by a chief named Biru. In fact this referred only to the northwestern shore of South America but it was a rumor which was to carry the Spaniards finally to the coast of the Inca empire. They collected gold and pearls and visited the Pearl Islands and by January of 1514 they were back again in Darien. Arriving at the Atlantic coast, proud of his accomplishments, Balboa received here news that saddened him and threatened his plans. A messenger named Arbolancha came from the King. The King had acted on Encisco's complaint and Balboa was deposed as governor. One Pedrarias Dávila (Pedro Arias d'Avila) was appointed to succeed him.

Arbolancha himself was not unsympathetic to Balboa and saw that Encisco's report was misleading. He grew to like and admire Balboa and returned to Spain to make a favorable report to the King. He carried back gold and pearls and an account of the new Spanish discoveries.

Balboa determined to make the best use of the time that remained to him, and evolved a plan which he pursued even after Dávila's arrival. He decided to build vessels and to set out for conquests on the "Great South Sea." Timbers for the vessels were cut at Acla on the Atlantic slope. Materials were assembled and all these things were transported on the backs of men over the sierras and down to a small river on the Pacific side. Even anchors, rigging and other heavy equipment were carried across the Isthmus in the same way. Only an indomitable man with ability for organization and real powers of leadership and persuasion could have carried out this gigantic task. He organized a simple commissary service to feed the great numbers of men required in this undertaking. He built a station and camp at the very top of the mountains to serve as a rest depot for the transport service.

Finally, when all the materials were deposited on the Pacific slopes, it was discovered that most of the timbers were already worm-eaten. Despite the coming of the rains and many other difficulties, the new timber was cut and finally two brigantines were launched and Balboa and his men embarked on the Pacific.

In the work of transporting the ships, over 500 Indians perished. This has been brought forward as an evidence of Balboa's cruelty and inhumanity. But this was no wanton destruction of Indian life by firearms or by the sword or by torture. The Indians apparently died from overwork, exhaustion and disease, possibly also from insufficient food. Undoubtedly Balboa thought of this loss as a regrettable but unavoidable incident in getting a great task accomplished. How Balboa himself survived is something of a wonder for he did not spare himself in the strenuous work. He crossed the Isthmus not once but apparently twenty times.

Balboa is everywhere spoken of as being a great leader in the sense that he personally looked after his companions, his soldiers and even his Indians. Oviedo, the historian, who knew Balboa at the time and who was hostile to him rather than his friend, says of him that of all the commanders he had seen in the Indies, Vasco Nuñez de Balboa was the best in this respect.

Although he obtained information from Indians by putting them to the Question and other tortures, and on at least one occasion took a village by appearing before it as a friend under a flag of truce, he had a reputation for friendly dealings with the Indians and on the whole he managed his crossings of the Isthmus well. At one time he succeeded in building up about him a league of 20 friendly chiefs.

But he was replaced by Pedrarias Dávila, an older and more embittered man, with tougher methods. It is true that the King on the arrival of Arbolancha in Spain tried to send a new message in support of Balboa. But the wise action came too late. The damage had already been done in the appointment of the crusty and vindictive Dávila. Dávila and his captains took captives right and left. They burned villages, they killed and captured Indians in great number. On one occasion they came across a friendly village that was celebrating a dance ceremony; the men were separated on one side of the camp and the women on the other. It seemed a fine opportunity to carry off and ravage the women and girls and this was done. On another occasion a captain beset and in flight wounded and maimed a slave every half mile, leaving them behind in the trail to be picked up by the pursuers. It was common practice in Darien and Quarequa for the Spanish captains to keep packs of dogs. These dogs were used in hunting Indians and as punishment slaves were often thrown them to be torn and eaten so that the dogs became familiar with the taste of human flesh.

In the end it was of little avail to Balboa that he should have discovered the "Great South Sea" and reported the wealth of the Pearl Islands and of Biru and that he should have built the first Spanish ships on the Pacific. Dávila, pretending to seek his friendly advice, recalled him from the Pacific to the Atlantic coast. Balboa came at once, willing to be of service. It was his former comrade Francisco Pizarro who met him with an armed force outside the settlement of Acla and arrested him. Balboa said, "What is this, Francisco? You were not wont to come out in this fashion to receive me."

In the end Dávila accused Balboa unjustly of treason, coerced the judge and had Balboa and those who were still loyal to him beheaded in the sight of their former comrades and their Indian allies. But even as his head rolled in the dust Magellan was preparing in Spain the ships that were to cross the ocean Balboa had discovered.

A Note on Cruelty and Conquest

By the standards of his people and his time Balboa was not cruel. But Dávila was. There were complaints against him and it was dimly recognized that what he did was bad for the colony as well as for the Indians. Yet the cruelties performed under him were almost characteristic and were repeated, and even exceeded, under other leaders in other regions. Where these cruelties were not restrained and where the system of capturing the Indians and dividing them among the conquerors to use as slave-labor was in full force the Indian population melted like snow before the April sun. Las Casas says, "Whereas there were more than 3,000,000 souls inborn we saw in Hispaniola, there are today (1542) not more than 200 of native population left." According to Oviedo there were in 1514 when Pedrarias arrived, 2,000,000 Indians in Castilla del Oro. In 1519 when he settled Panama the country was almost depopulated. A memorial addressed to Cardinal Ximenes, 1517, says the native population of Hispaniola had been reduced from a million to about 16,000 people. All these estimates of the original population are probably greatly exaggerated but that the population, whatever it was, was almost wiped out is not to be doubted. This represented a double loss, both in economic and in human terms. The need to replace the dying Indians gave the great impetus to the African slave trade.

Of course the Spaniards were not alone in putting a blight on native life. Many nations in many parts of the world have produced, and still produce, such effects. In 1849 the advent of Americans to California was attended with a shocking destruction of the Indians. Nor was the death of the Indians due solely to cruelty and slavery. Disease played a great part. The Indians died from "white" diseases to which they were not immune, such as small-pox, tuberculosis, and even simple diseases like measles and common colds. But here the Spaniards got as good as they gave, dying in their turn from typhoid, yellow fever and other tropical diseases. Shortage of food also played a part. The Spaniards counted on living off the land. They took supplies from the Indians, who suffered in consequence. Often the hunting and the agriculture of a district could not support the combined population.

But the disease and the starvation were accentuated by the callousness and brutality of the invaders. Here as in other situations in human history the removal of the ordinary restraints of society and the helplessness of the victims aroused and gave full scope to warped and unbalanced personalities. Correspondingly the sane leaders and the constructive influences were handicapped.

Under such circumstances leaders like Balboa, De Vaca and Father Las Casas who had the welfare of the Indians at heart were working under the greatest handicaps. They had with them in the rank and file men who did not represent the best influences in Spain. There were, of course, admirable men among the conquerors, but they were numerically outbalanced by the wanderers, the misfits, and the fugitives, elements whose power increased as the contact of the exploring party with orderly government was diminished.

Yet this is not the whole explanation. Not infrequently the humane leaders received little if any support from the Spanish authorities. It was not only that communication was slow and the control of the Crown tenuous, but also that Spain herself was still struggling, as were other nations of Europe, with a background of savage ideas. The philosophy and even the practices of the Inquisition were still fresh in men's minds. The appeal of humane leaders to the Church and the Court at home often fell on deaf ears. We learned during the World War that the most blood-thirsty were not always the men in the trenches but the people safe at home. So it was here. Spain and Portugal were growing great on the activity of the adventurers. As long as the cruelties were not apparent, the powers were not too curious to inquire the cost at which the greatness was attained. The Crown wanted more power, the Church wanted converts, the business man wanted increased trade and his little share of the treasure of the Indies.

This background helps us to understand why so many of the colonies after a temporary success became so soon economically exhausted; why the conquerors fought each other with almost the same savagery and cruelty they used towards the Indians. It throws a light on both the successes and failures among the explorers.

FERDINAND MAGELLAN (ABOUT 1480-1521)

MEN who hold arbitrary power often make mistakes. But the distinction of having made one of the most complete blunders in history rests with King Manuel of Portugal. He misjudged a man, showed himself ignorant of science, and lost an empire on that day in 1517 when he informed Magellan that his services were no longer required by Portugal.

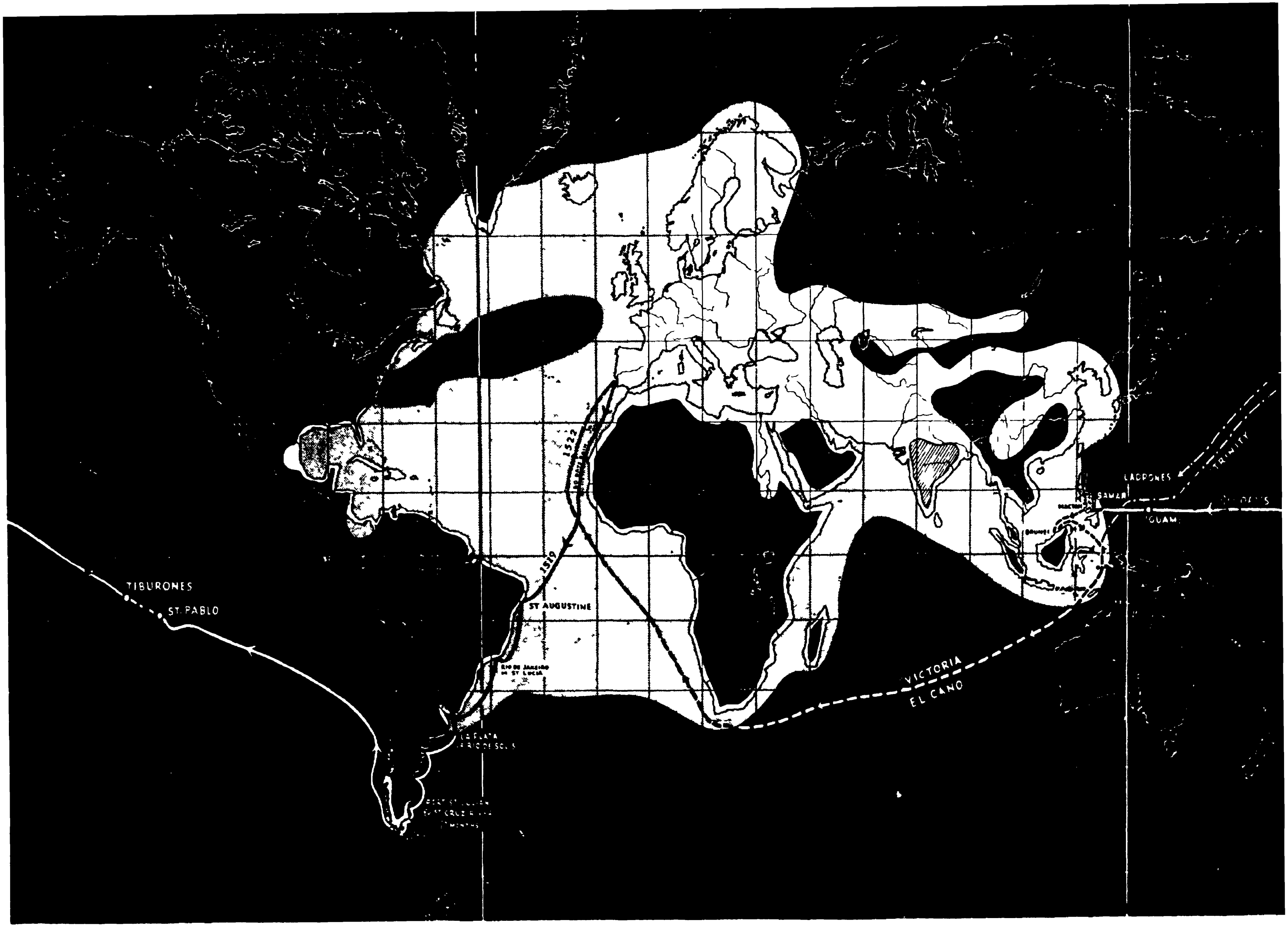
There was no excuse for the error. Magellan, at that instant when he stood before the King and humbly begged for a fleet to take to the Indies by a western route around America, had already proved himself an able navigator, a courageous soldier, a faithful servant to the Crown and a man of vision.

Magellan had been born in 1480 at Sabrosa, in the one province of Portugal that had no seacoast. But at 13 years of age he was attached as a page to the Court of Lisbon. He was 17 years of age when Vasco da Gama started on his trip around the Cape to India, and he was there 26 months later when the first ship of Da Gama's fleet returned. Magellan must have been stirred by these events, for in 1504 he volunteered for the great Portuguese adventure—service in India.

He was attached to a ship of Diego Lopez Sequira, who was authorized by King Manuel to explore the Malay Archipelago. Magellan fought with the fleet against the Mohammedans and the natives at Goa and at Cochin and at Malacca Harbor. He was twice wounded and many times distinguished himself in action. He saw the rich civilization that centered around Sumatra and Malacca. He sailed among the islands and observed a simpler type of native life as he moved eastward. One of Magellan's companions, Francisco Serrano, remained in the East to serve a native prince on the island Ternate. Magellan may then have been speculating upon the possibility of reaching the Indies by a western route.

In any event, he had returned to Portugal by June, 1512, and began to extend his studies in navigation and to make feverish plans for rejoining his friend Serrano by a western route. But in 1513 he was sent on an expedition against the Moors in Morocco. Magellan's part of the expedition was easily victorious, but he was charged with some mismanagement. He returned to Lisbon to meet the charges, but they were never pressed. In 1517 he went before the King with a completely formulated plan for trying the route around America to the Indies. The fact that Balboa in 1513 had crossed the Isthmus of Panama and sighted the Pacific only increased his eagerness. At the close of that momentous interview, Magellan renounced his Portuguese citizenship and went to Spain. Here, supported by the Bishop of Burgos and by the Barbosa family, he laid his plan before King Charles and was authorized to explore in the East along the demarcation line. The year 1518 was spent in preparation, in dealing with endless petty rivalries and jealousies with the Portuguese influence and propaganda working against him. At last, in the summer of 1519, he was appointed Captain-General of a fleet of five ships.

They paused for water and supplies on the



MAGELLAN, 1519-1522

Showing also lines of Treaty of Tordesillas

26th of September at Teneriffe. Before they sailed from Teneriffe on October 3rd a vessel overtook them with a letter from Lisbon. Diego Barbosa wrote to Magellan to say that he must be on his guard; the Spanish captains were jealous, in particular Juan de Cartegena. Magellan held his peace and sailed.

They ran south between the Cape Verde Islands and the Cape. Here storms and headwinds beset them, and for 60 days it rained. St. Elmo's fire came and hung on their masts and in the shrouds. After this portent the weather cleared. They bore away to the south and west, making for the nearest point on the South American coast. But before they sighted land several of the sea captains had refused the full salute to the Captain-General, and had quarreled with the course set. Magellan replied, "Follow the flagship and ask no questions."

On November 23rd they had sighted Cape St. Augustine and here they were well received by the natives. By December 13th they had made their way to Santa Lucia Bay—that is, at Rio de Janeiro.

In March of 1520 they had reached 49° and more of south latitude. In the bleak and cold weather they headed in between breakers and dropped into a desolate little harbor which they christened Port St. Julian. Hardly were the anchors down when a mutiny broke out on the stormy night of April 1st. Quesada, Cartegena, El Cano and 30 men from the ship "Conception" seized the ship "San Antonio." Elorriaga, who was faithful to Magellan, was stabbed by Quesada. Mezquita, Magellan's cousin, was put in chains. The "Victoria" and "Conception" were in the hands of mutineers.

Gomez de Espinosa and Duarte Barbosa remained faithful to Magellan. On April 2nd Espinosa killed Mendoza and recaptured the "Victoria." At night the mutineers tried to run from the harbor. There was open warfare and gunfire and the mutineers were defeated.

There was no time for indecision. On April 4th Mendoza was quartered and impaled on stakes. Quesada was beheaded and quartered. Forty men were put in chains. Later Juan de Cartegena and Pedro de la Reina were marooned.

Unity of command and order are restored but the low scrubby country reeks of desolation and the dark bitter winter is still before them. . . . Magellan is impatient to sail around this country and come into the Pacific. At the end of April Serrano is ordered to take the "Santiago" and explore southward.

Time drags. Suddenly in the bleak daylight a giant native appears; his feet are thrust into clumsy hide boots padded with straw and he dances uncouthly on the beach. They name the place Patagonia (the land of the big feet). Other natives appear and two are captured and taken aboard the ship. One evening two more men appear on the beach dancing in the cold. They are at first mistaken for natives but turn out to be men from the "Santiago." They have discovered a river which they have named the "Santa Cruz." But the ship has been wrecked in a hopeless onshore gale. The crew is safe ashore but desperately in need of food. These two men have been walking for days through the vast swampy country. Magellan sends 24 men and provisions for two months to aid the survivors of the wreck. At last, after endless hardship, the crew of the "Santiago" returns. One ship has been lost. A number of men have been shot with poisoned arrows by natives or died of sickness. At least 40 men have been mutinous. But Magellan sails on, leaving two faithless comrades marooned and the corpses of several others still impaled on spears above the desolate beach.

It is August 24th when the fleet leaves Port St. Julian and sails southward. Barbosa is in charge of the "Victoria," Mezquita of the "San Antonio," Serrano of the "Conception." Winter storms are not over, but somehow the fleet comes through and on the 26th sails into the Santa Cruz River. Here they obtain fresh drinking water, catch plenty of fish, and capture guanacos for their meat supply.

It is October 18th before they get away from Santa Cruz, but on the 21st they round a great cape which they name "The Cape of the Eleven Thousand Virgins." The water is salt; they have come into the Strait at last!

The next day the "San Antonio" and the "Conception" are sent to explore the Strait. They return two days later. They have discovered a river which they have named "The River of Sardines," where small fish are plentiful, and 120 miles to the northwest they have discovered Cape Dezeada (the desired cape). On a further exploratory trip the "San Antonio" disappears. Mezquita has been put in chains; Gomez has seized the ship and is headed back to Spain. But at the time no one in the fleet knows this. Barbosa sails his vessel back to the Cape of the Eleven Thousand Virgins and plants there a banner and letter of instructions for the lost vessel. By November 18th the three remaining ships have found a western issue from the Strait and are in the Pacific.

The navigation of this Strait has been a marvel of seamanship. There have been tremendous tides running in channels that are too deep for anchorage. There have been head-winds and storms at night blowing down on them from the snow-capped peaks that hedge the channel. As the ships work westward they have seen the fires of natives on the desolate shore to the south of them and have called the land Tierra del Fuego.

The Pacific proves true to its name. There are no storms, but the passage becomes a horror and an exercise in endurance. Water runs short; food runs short; the ships run on, driven by an endless wind over an endless ocean. Biscuits become powdery and riddled with worms. Scurvy appears. Limbs of the men become weak, sore; their faces, discolored; their gums swell, enclosing the teeth in raw flesh, so that many can eat no more and die. On January 24th they pass a desolate and deserted island, but run on. On February 4th they pass another. They name the two the "Unfortunate Isles." The food is now all gone. They take the leather padding off the main yard. It is dry and hard. They soak it in the sea for four days, toast it on the fire and eat it. They eat sawdust to stuff out their gnawing bellies. The men grow more desperate than the most despised of animals. Rats, when they can be found, sell for half a ducat apiece. But even the rats are starving.

At last, on March 6th, they sight land again, but the natives prove unfriendly. There is a skirmish and seven natives are killed and a ship's boat is stolen from the fleet. With scanty supplies the ships set sail again. They christen the islands "Ladrones," Robbers' Isles. On March 16th, in breezes that are heavy with the smell of spices, they come to Samar in the Philippines.

At Samar the natives prove more friendly. At last a full stock of water and supplies are brought to the ship. Trade is established. The king and Magellan exchange visits and the Captain-General throws himself with great fervor into the conversion and baptism of the natives. The fleet sails on to Zulu and Hunumu. Trading, preaching and conversion continue; thousands are baptized in one day. The fleet proceeds to Cebu. Magellan begins to feel that his errand is being accomplished. It is only a question of time until he establishes contact again with the western world. Already they have encountered a native who understands the speech of Magellan's East Indian servant.

Now a feud and petty warfare break out between the chief of Cebu and the chief of some tribesmen on the little island of Mactan. Magellan feels he must sustain his converts and allies. He takes a party of about 40 men with him in small boats and they proceed against Mactan. But the natives have assembled in unexpected *number. Magellan succeeds in burning part of the village, but his parties are driven back on the beach. His own party is the last to leave, fighting even at the water's edge to protect the flight of* the others to the boats. Twice the Commander's helmet is knocked from his head; he recovers it. He is wounded in the leg and a poisoned dart hits him in the face. He is still fighting and glancing over his shoulder to see that his men have reached the boats in safety when a blow from a scimiter cuts him down and the savages close in. Eight men die with their commander; the rest escape to the boats. Magellan sinks beneath the shallow bloody water on the beach of Mactan, natives still stabbing at him through the waves. The fleet sails on.

Barbosa and El Cano are now in command. The fleet reaches the Island of Bohol. There are now too few to work the remaining three ships. The "Conception" is abandoned and burned. The "Trinidad" and the "Victoria" proceed to Tidore. Here there is another feud between petty chiefs. The chief of Ternate has received favors and trade with the Portuguese, so the chief of Tidore allies himself with this Spanish expedition. The first ships are now sailing around the world, and already the quarrels of European nations are reflected in native warfare! Magellan's old friend, Francisco Serrano, has already died at Tidore. Brave Barbosa and a small company are caught in a native skirmish. The ships sail, abandoning them on the beach.

The company is now dwindling fast. The "Trinidad" is growing clumsy and leaky. With Espinosa in command and a company of men, she is left behind in the Islands. Later she makes an attempt to sail back to America, but turns around and in desperate condition reaches the Islands again before she finally becomes unmanageable.

El Cano, with 47 Spaniards and 13 natives, sets sail across the Indian Ocean in the "Victoria." She is overburdened with a great cargo of cloves. She is short of provisions and leaky. Of the 60, some die of disease, some are killed as punishment, some are killed by natives. On several occasions the ship is harried by the Portuguese. The ship puts in to the Cape Verdes for provisions; her identity is suspected. El Cano flees, abandoning more of his men ashore.

On Monday, September 8th, the "Victoria" ties up at the quay at Seville. Of the five ships and 243 men that had sailed, one ship and 18 men have returned. They have been three years less twelve days on the way. Pigafetta, who has written a careful account of the voyage, is surprised to note that it is Wednesday by his record while it is Thursday ashore. Later 13 of the men left on the Cape Verdes reach Seville. Years later 4 of the men from the "Trinidad" also return.

The cargo of cloves is sold and yields more than the cost of fitting out the entire expedition. But Magellan, his family, and most of his supporters are dead.

King Manuel, as if to confirm his own defects and to raise a monument to his error, orders the arms of Magellan effaced from the buildings at Sabrosa.

The evening after El Cano's ship ties up at the old quay along the Guadalquivir by the Torre d'Oro, there is a public celebration, and the crew, in ragged shirts and barefoot, are to visit the shrine of St. Mary of Victory. About the gangway a procession is forming. Headed by a priest, the tattered crew are coming over the bulwarks. As they pass, the citizens thrust lighted candles in the hands of the mariners. Here comes the cabin boy, Juan de Zubileta. With the men he has tasted the explorer's fate and his eyes shine with disturbing visions. They have come home! Here it is—but not quite real. Somewhere out there is reality—the savage people and the savage seas. They have left their great commander on the beach at Mactan. The bodies of their comrades mark a trail around the world. They have looked on the storms of Patagonia and seen the golden girls of the islands. For years they have looked on wonder and death and they will never see the old simple world again. Seville not the same—the friends not familiar. Why do the throngs cheer? Do they know the feel of flesh softening and rotting on one's bones? How tell them of the still hour—the bay like blue velvet—before the dawn-light breaks over the peaks of Ternate.

Yes, yes, give thanks. The cabin boy grasps his candle and stumbles up the quay under the shadow of the Tower of Gold.

A Note on the First Man around the World

IT is of course to Magellan's genius and courage that we owe the organization of the first trip around the world. It was El Cano who, after Magellan's death, brought the survivors home. To these men the accomplishment is due. However, by a curious quirk of fortune it happens that the first individual known to history to have passed around the world was a treacherous East Indian slave. I have never seen the matter commented on, though the passage of this man around the world is easily ascertained from the original Spanish records.

This man was known as "Malacca Henry." When Magellan was in the East with Almeida between 1504 and 1512, he bought this man as a slave in Malacca and this fact accounts for his name. When Magellan returned home he kept Malacca Henry with him. He was in Spain 7 years and during the preparation of the voyage doubtless gave Magellan information about the Indies. Malacca Henry was known and commented on both in Lisbon and Seville. It is to one of these commentators, Maximilian, that we owe a definite statement that Malacca Henry really came from the Moluccas. In other words, he was a foreign slave bartered for in Malacca.

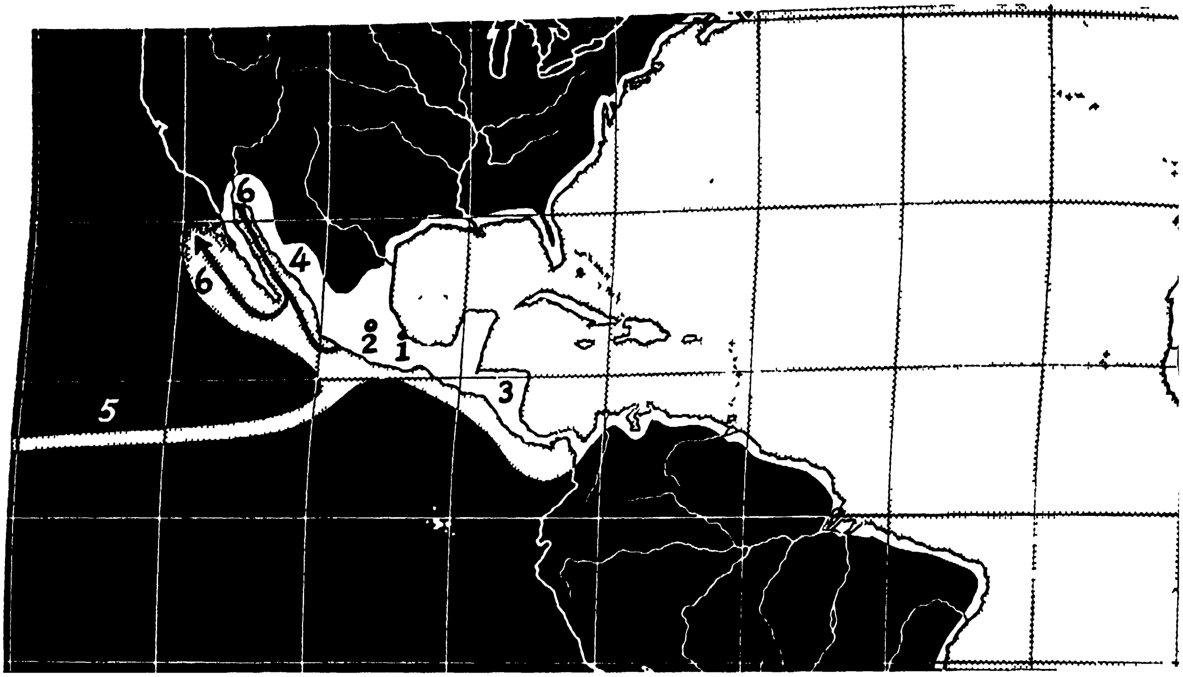
When Magellan sailed, he took Malacca Henry with him and when they reached the Philippines and were working toward the Spice Islands, he served as negotiator and interpreter. The fact that Malacca Henry could converse with some of the natives they encountered gave the Spaniards a definite indication that they had arrived back in a part of the world that had already been in touch with European voyagers.

The fact that this man knew the local dialects in parts of the Philippines and the Moluccas, and his final behavior, both confirm the impression that this was the real point of his origin. In the sorry affair at Cebu, the Spaniards depended on Henry for their contact with the natives. Henry betrayed them apparently with a view to escape and to establisning himself as a person of local importance. It was in a great measure owing to him that the brave and learned Duarte Barbosa was trapped and deserted. We last see Henry on the beach of Cebu still alive. He was near home, having made the first passage around the world recorded in history. It was a year later before the Spaniards under El Cano reached Seville.

HERNANDO CORTÉS (1485-1547)

YOUNG Cortés was an impetuous but somewhat embarrassing lover: he had the misfortune to fall from the balcony of a lady with whom he was conducting a love intrigue and injured himself seriously. This was in Salamanca in 1502, when Cortés was only 17 years of age. What bothered him about this accident was not that he would miss time at the university, where he was supposed to be getting an education, but that he would be unable to start for the western world as he had already planned to do. He meant to join Ovando who was going out to Santo Domingo to succeed Bobadilla as commander.

It is clear that Cortés was another example of the young adventurer who found in the busy and rowdy period of Spanish expansion an opportunity to exercise his not inconsiderable talents. His assets were good looks, good health, courage, decision and a wonderful capacity for intrigue and double-dealing which he exercised in love as well as in war, on his countrymen as well as on his Indian enemies.



CORTÉS

(1) Landed, 1519. (2) Mexico City (Tenochtitlan), 1520. (3) Honduras, 1524. (4) Culiacán, 153
(5) Saavedra to the Moluccas, 1527. (6) Ulloa explores the Gulf of California, rounds peninsula an
disappear

Owing to his accident, two years went by before he was able to present himself to Ovando in Hispaniola. He was welcomed, received a grant of land and of Indian servants and became for a while a planter. Seven years later he went with Velasquez on an expedition to Cuba and remained to become the *alcalde,* or mayor, of Santiago. He seems to have done well enough with his farming, mining and slave-driving to have been able to fill this office with some pomp and distinction. While cultivating the soil he did not neglect to cultivate also his relationship with Velasquez, so that in 1518 he secured the leadership of the fleet and forces that were being sent to colonize Mexico.

That there was a Mexico to conquer was known through two previous expeditions that had been carried out by Córdoba in 1517 and by Grijalva in 1518. Grijalva had sailed around the shores of Yucatan and had also gone westward to the district that is now known as Tabasco. He had brought back golden treasures and glowing stories of the wealth and power of the Indians. Had modesty, merit and judgment counted with Velasquez, Grijalva should have been the leader of the new expedition.

But they did not count and Cortés was off before Grijalva had even returned. He had hardly sailed before Velasquez changed his mind and sent letters after him to Trinidad in Cuba cancelling his commission.

Cortés had already so firmly established himself in command of the expedition that aid or hindrance from Velasquez was of little importance to him. He had also picked up a number of recruits from among Grijalva's returned soldiers. He proceeded to Havana and sailed from there to the eastern extremity of Yucatan. At Cape St. Antonio a muster of his forces showed that he had 11 vessels, 110 mariners, 553 soldiers, including crossbowmen, arquebusiers, 200 Indians of the island and a few Indian women, 10 heavy guns, 4 falconets, ammunition and 16 horses. From here he proceeded along the coast of Mexico proper and anchored at San Juan de Ulloa (the present site of Vera Cruz).

It was here that the first exchange of information passed between Montezuma and Cortés. Messages sped to the king sitting at Tenochtitlan (Mexico City), the capital which the Aztecs had built in the middle of a broad lake. These messages brought startling news of the newcomers, of their firearms, of their "floating fortresses" and terrifying horses. Montezuma was impressed and decided in his turn to impress the foreigners. He sent lavish gifts, borne by a hundred slaves and accompanied by two important Aztec nobles. These included armor embossed with plates of pure gold, elaborate and highly decorated articles of clothing, many textiles and sculptures of birds and animals cast in gold and silver. A Spanish helmet, which had been sent to the capital, he returned filled to the brim with gold dust, and there were plates of gold and silver as large as carriage wheels. Unfortunately for him, Montezuma did not sufficiently understand the Spanish character. After this evidence of wealth it was futile for his envoys to deliver a message that advised the Spaniards to return home with these proofs of friendship. It was useless for the envoys to suggest that the capital was too far away and the trail difficult and dangerous.

In the meantime, everything was at odds in the Spanish camp. There was a shortage of food supplies and there were real privations. The Spanish force was also divided in its purposes. There were friends of Velasquez who wished to return and a sizeable, discontented faction. The expedition, also, had been somewhat divided: Cortés had despatched Francisco de Montejo with two vessels to explore the coast in a northerly direction. They had proceeded as far as Pánuco (near Tampico) and had returned. The whole expedition then moved northward by land and by sea, advancing into a richer and more fruitful portion of the coast. Along the route of march they collected reënforcements from native tribes. At Chiahuitzla the ships were gathered into the harbor, which Montejo had discovered. Here they founded the city of Villa Rica de Vera Cruz, and this became the base of their further operations.

At the new settlement discontent and conspiracy continued. It was then that Cortés determined upon one of the boldest steps of his career—an act that has few parallels in military history. He burned and sank his fleet, saving only one small vessel which he intended to send to Spain with despatches and gifts for the Emperor. It was clear in his own mind that there was to be no further division of forces or of authority, that they were to march to Mexico and succeed or all perish together! This was in August, 1519. By September they had advanced to Tlascala. Here they conquered the natives in open battle, burned many villages and imprisoned the survivors. At Cholula similar events were reenacted. They had now accumulated a following of 6,000 natives from various tribes who were ready to attack Mexico with the powerful newcomers. Montezuma, in fear, was now sending messages, still urging them to avoid the capital.

It was in the early part of November, while the Spaniards were still advancing, when Montezuma came out in great state to welcome Cortés and his followers.

Both leaders were now openly professing amity and friendship and respect, but each was watching the other for an opportunity to carry out elaborate plans of trickery, ambush and sudden attack. When Cortés was finally lodged in honor in the palace itself, Montezuma was seized and held as a hostage. For a while he was kept in chains and was made to swear allegiance to the Spanish Emperor and forced to pay tribute.

Additional wealth was collected from all the provinces. The idols and images of the gods in the temples were destroyed or removed by the Spaniards and in their places crosses and altars were erected. This aroused the hostility of the natives as nothing else had aroused them.

Cortés and his men were now enthroned in the very heart of the Mexican empire but never were there conquerors in a more ambiguous, uneasy and dangerous position. Cortés, to relieve the tension of the situation, sent men to the coast to build a fleet. He let it be supposed that he was departing from Mexico. Actually, he was simply playing for time. He began to wish most mightily that he might receive recognition and authorization from Spain and the opportunity of gathering reënforcements from Cuba.

What did come to him from Cuba was not a friend but an enemy. This was Pánfilo de Narvaez, who dropped anchor at San Juan de Ulloa in April, 1520. He had been sent by Velasquez to establish control over Cortés. But Velasquez had sent a cat to capture a tiger!

Hearing the news, Cortés grabbed up 70 soldiers, dashed to the coast and after negotiating with Narvaez caught him one night off his guard during a storm and a downpour of rain. Narvaez lost an eye in the battle, was defeated and made an ignominious exit from the Mexican scene. Most of his followers joined Cortés's forces.

Cortés sped back to the capital, only to find the city in turmoil. A revolt of the outraged natives was directed not only at the Spaniards but also at Montezuma, whom they regarded as a dangerous tool in the Spaniards' hands. Cortés pushed Montezuma forward, urging him to address the aroused subjects. Montezuma was struck dead. It was now clear to Cortés that there was not a moment to be lost! During the night he attempted to evacuate the city with his thousand or so of Spaniards, 6,000 allies, and their equipment and spoils. He was cut off at the bridges and reached the mainland with only 500 Spaniards and 2,000 Indians. He escaped northward about the lake, but had the Aztecs followed up their advantage, there is no doubt that the whole Spanish forces could have been annihilated.

Despite discouragement and fatigue and famine, Cortés pulled his forces together again. They were sufficiently strong to defeat a large Mexican force at Otumba in July. His prestige was now restored and his reputation enlarged. He began systematically assembling and guiding another auxiliary army of natives. He sent expeditions abroad and captured province after province as he moved again southward on Mexico. He constructed a fleet of brigantines at the northern end of the lake and sent out a party to make a reconnaissance and to become thoroughly familiar with this terrain. Another party investigated the southern borders of the Mexican valley. After a siege of several months he was successful in retaking the city. The backbone of Mexican opposition was now broken.

Established in the capital, Cortés sent out expeditions of exploration and conquest. Two small expeditions reached the "great Southern Ocean" (the Pacific) by passing through the state of Michuacan (Michoacán). Cortés was delighted, for this ocean was supposed at the time to be identical with the great Indian Ocean and thus filled with islands fabulously rich in gold and pearls.

In 1523 Cortés sent out Pedro de Alvarado, who burned and battled his way through the Cordilleras and the valley of Oaxaca. His large, mixed force of Indians and Spaniards proceeded to the conquest of Guatemala.

In the following year Cortés sent out a fleet under Cristóbal de Olid. This expedition was to find a strait, which would lead them to the "Southern Ocean." Olid sailed to Havana, where he picked up ammunition and horses. He then proceeded to Honduras, where he started on a conquest of his own and, finding power pleasant, claimed an independent jurisdiction.

In the fall of the year the news of Olid's action came to Cortés, and he started out with a considerable expedition to put Olid in his place. He made a long and difficult journey overland southward, traveling through the marshes, the flooded rivers and the tropical jungles of Tabasco, Yucatan and Honduras. At one point, in order to advance 100 miles, he was forced to construct over 50 bridges. In the huge tropical forests, their Indian guides deserted them, many of the Spaniards fell sick, and the Indian servants died of starvation. The rainy season set in and the rain fell on them day and night as they marched and as they huddled for shelter under the trees. Finally they reached a Spanish settlement at the head of the Bay of Honduras. They explored the vicinity but were in a state of famine when a vessel fortunately arrived with provisions from Cuba. Here weary Cortés learned that his march of 1,500 miles had been in vain: Olid had died before Cortés had even left the city of Mexico!

Cortés patched up two small ships and, embarking his force, sailed down the coast of Honduras. He established the city of Natividad and set about the exploration and the colonization of the country in earnest, intending to push his discoveries into the territory that is now Nicaragua. But at this juncture he had disturbing news from Mexico. It was reported in Mexico that Cortés had died. The government had been seized and the estates of the absent Cortés and his followers had been reapportioned.

He arrived back in Mexico in May of 1526 and was given an enthusiastic welcome from the Spanish settlers, but he was tired and worn and broken in health from his long campaigns and exertions. There was little abatement in his interests, his energies, or his capacities. It was not his fault, but somehow the tide, which had borne him forward, now turned.

In Spain his enemies had been at work against him and he was now supplanted in the government.

Cortés decided to leave for Spain and to lay his case directly before the Emperor. Landing in Palos in May, 1528, he met another adventurer and conqueror who was also a friend and kinsman. This was Francisco Pizarro who had returned from the Pacific beyond Panama to obtain aid for his impending assault on Peru.

Cortés was given a brilliant reception on his arrival in Spain. In July of 1529 the Emperor made him "Marquess of the Valley of Oaxaca." He was also assigned a vast tract of land in Oaxaca, together with large estates in the city of Mexico and other places in the Valley. This included about 20 large towns and villages and 23,000 vassals. The Emperor would not reinstate him in the government but did reinstate him in his military command, naming him Captain-General of New Spain. He was empowered to make discoveries in the Southern Ocean with the right to rule over such lands as he should colonize, and he was to become proprietor of one-twelfth of all his discoveries.

But when Cortés returned to Mexico in the spring of 1530 he found it was not so easy to pursue his explorations. Nuñez de Guzman, one of his confirmed enemies, was now the head of the *audencia,* the body that really ruled the country. Though Cortés was still well received and acclaimed everywhere, countless difficulties were put in the way of his expeditions. Nevertheless, he now embarked on a new series on the Pacific.

He had already, in 1527, equipped and sent out three vessels under his cousin Alvaro de Saavedra to the Moluccas. Two of the vessels were lost in the Pacific but Saavedra's own ship reached there. He was therefore the second man to cross the Pacific—Magellan having preceded him by only six years. He died on the return voyage and his men, having lost heart, turned the ship about and went again to the Moluccas. Here they fell in with the Portuguese, were imprisoned and only 8 finally succeeded in reaching Spain.

In 1532 and 1533 Cortés again sent expeditions out. The former, under the command of Hurtado de Mendoza, met with little success, for Guzman continued to harry and pursue Cortés's ships. However, in the expedition of 1533 Lower California was discovered. Then, in 1534-1535, Cortés himself led an expedition, sending a land expedition northward while the vessels proceeded by sea. He crossed the "Sea of Cortés" (Gulf of California) and commenced a settlement on the eastern shore. Supplies ran short and they ran into a succession of violent storms, but Cortés finally brought the vessels into the port of Santa Cruz from which they had sailed.

Then in 1539 Francisco de Ulloa sailed in command of three of Cortés's ships, went down the shore of Lower California, rounding the cape and then starting up the Pacific shore of Lower California. About latitude 28° N. he sent one of his vessels back to Mexico with a report. With the two other vessels he continued on a northward course and sailed right out of history.

It was Juan Rodríguez Cabrillo, a Portuguese in the service of the Spanish, who followed up Ulloa's explorations. In 1542 or 1543 he sailed in two ships around the lower end of California and up the coast. He stopped at San Miguel (probably the site of the present San Diego), then ran north but had to turn back because of heavy winter storms. He may have gotten as far as the region of San Francisco. After his death the following winter, Bartolomé Ferrelo, his chief pilot, took the ships north and may have reached a latitude around 42° or 43° N.

In 1540 Cortés went to Spain, again seeking assistance and support and hoping to recover some of the losses which had depleted his great fortune. Although he was well received at Court, his appeals fell on deaf ears. His fortune was dwindling rapidly, he was separated from his family in Mexico, and he was discouraged and embittered at the callous indifference of the Emperor. Finally, when word came that he might return to Mexico, he started out. But, near Seville, his strength and health failed him and he died in 1547 in his sixty-second year.

A Note on the Horse in America

THERE were no horses in America when the Spaniards arrived. The horse first paralyzed the Indians with astonishment and later in battle made them sweat with terror. For the Spaniards saw their advantage and pressed it to the utmost. They already had the advantage of firearms and of better defensive armor, but these things the Indians might have overcome through their greater number, their knowledge of the country and their defended positions. But the horse turned the scale. Many a Spanish conqueror wrote home, "After God, we owe the victory to the horses."

It was not only that the horse gave a superior elevation from which the rider could slash and thrust at a score of opponents, or even that the horse gave superior speed both for travel and attack. The Spaniards especially trained their horses to charge into a solid phalanx of Indian warriors, kicking and pawing and trampling them into the earth.

Scores of fantastic stories are told which show the misunderstanding and the superstitious dread which the Indian mind created about the horse. In Mexico the Indians thought that the horse and rider formed one animal. They used to take captives to the altars on their high pyramids and there cut their hearts out as a sacrificial offering. On one occasion they brought down a horse and rider and tried to carry them off bodily as a single sacrifice.

Bernal Diaz tells of the surprise and consternation of the Indians when they first saw a Spanish cavalier fall from his charger. There is also a story of how Cortés on his march to Central America left behind a horse which he charged the Indians to keep for him. This they did with great care, thinking the animal was somehow an emissary from the gods. Unfortunately, they tried to feed the animal only upon chickens so that it died. There are other stories of how flowers were offered by the Indians to horses as feed.

In past geological ages there had been horses in America but these had died out. The wild horses that were found by later explorers and travelers in the Americas were all the descendants of those that had been abandoned by the Spaniards or that had escaped. Horses of the American plains and of the plateau regions are believed to be descended from horses left by De Soto on his march to the Mississippi Valley in 1541. When Coronado was advancing into the plains-states from the southwest his party may also have contributed some animals. The Pawnee have a story that in one case a horse came into their camp quite tame and allowed himself to be approached and handled. It is certain that once started the horse found in the grass-lands of the plains an environment admirably suited to him and that he spread with great rapidity. Hendry saw wild horses on the Saskatchewan in 1754.

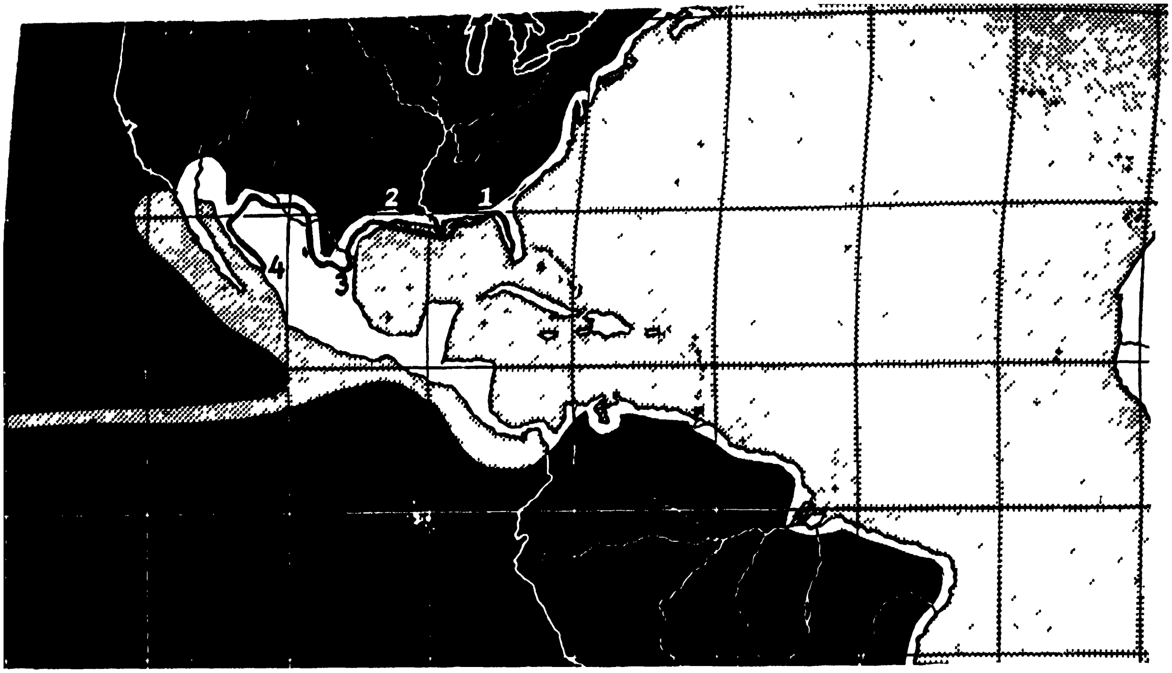
The Indians of the Plains adopted the horse at once. The horse spread their culture far and wide. It is curious that a form of life which we think of as so natural and characteristic of the North American Indian should have been in such a great measure dependent on an animal brought to this country from Europe.

ALVAREZ NUÑEZ CABEZA DE VACA (1490-1564) CROSSES AMERICA

DE VACA began his career in America as treasurer of Narvaez's ill-fated expedition. This was the same Narvaez who had lost an eye trying vainly to curb Cortés in Mexico. In 1527 Narvaez started with an expedition to colonize the country of Florida which Ponce de Leon had discovered. It took him a year to reach that coast and by this time two ships and 60 men had been lost in a hurricane and others must have deserted for there were only 300 in the party when it reached Florida. Against the advice of De Vaca Narvaez started a march through Florida. The fleet after waiting a year sailed home. Narvaez's land expedition underwent great hardships, made few discoveries and met with disaster. Indians attacked and harassed the party and it suffered from hunger, sickness, and treachery in the ranks. At last they reached the region around Appalache Bay. Narvaez had now despaired of being picked up by his fleet. He began the construction of a number of boats in which they were to make their escape. They made a small forge and improvised bellows out of wood and deer skins. Tools, nails and other fastenings were made from all the scraps of metal that the company possessed. Stirrups, spurs and many other objects were melted for this purpose. Such horses as they still had with them were killed and eaten; the hides were tanned and converted into bottles for storing water on the ships. The men took their clothing and even the shirts from their backs to make the sails. Five boats were built and launched. Most of these met with disaster and Narvaez himself was lost.

De Vaca has been most active in the building of the ships and the plan for escape. He commands one of the five shaky vessels in which the wretched men, stripped of their arms and even of their clothing, embark in the vessels they have constructed. They push out of the bay into the waters of the Gulf, heading westward along the shore. They are short of food and have been short of food for some time; they are naked and cold. The boats open up and begin to leak. The horsehide water-bottles have been improperly tanned; they begin to rot and leak and such water as they keep stinks.

Off the mouth of the Mississippi the current sweeps them into the Gulf. For three days they are out of sight of land and out of touch with



CABEZA DE VACA, 1528 1536

(1) The Bay of Horses, where Narvaez and De Vaca built the boats (2) Bad Luck Island, where De Vaca was wrecked and his wanderings and slavery began (3) The *tuna* (prickly pear cactus) fields, where he and his companions escaped and turned west (4) Sinaloa and Culiacan, where his wanderings ended 1536

each other. Then for four days the boat that De Vaca is in drifts within sight of one of the other boats. But they are separated by another storm. One by one the comrades drop from exhaustion into the bottom of the boat until De Vaca is left alone, steering the cranky craft through the darkness, running before the gale. In the morning he drives the boat ashore on a long narrow island on what is now the Texas coast. It is November 6th and bitterly cold for the naked men. De Vaca says they are in such a state that every bone can easily be counted and they look like death itself. Another boat comes into the island so that there are in all 80 Spaniards confronting the Indians who inhabit the island.

It was with justice that De Vaca calls the place the "Island of Ill Fortune." They are in the last stages of misery and helplessness, unarmed and too weak to offer any resistance to the Indians. De Vaca suggests that they give themselves up to the Indians in exchange for shelter and food, but the other men hesitate, having heard stories of the human sacrifices offered by the Indians in Mexico. De Vaca makes the suggestion to the Indians and after a time they are taken along to the Indian camp.

Some of the men try to reach the mainland and journey westward, but are lost. In the cold months, sickness descends on them and by the end of the winter there are but 15 left alive. The Indians also are ill, so that half of their number die. They believe that the white men are responsible for this plague, debate the advisability of killing the white survivors, but do not act on the suggestion.

In the spring there began for De Vaca and for the Spanish survivors a long succession of years of slavery or servitude to the Indians and of wandering from place to place. Of all the men who set out with Narvaez only four survived to reach Spain again. In addition to De Vaca himself there were Andres Dorantes de Carranca (spoken of as Dorantes), Captain Alonzo del Castillo Maldonado (Castillo), and Estévan, a Moor. For a while also De Vaca kept in touch with a man by the name of Lope de Oviedo and another named Hiéronimo de Alaniez. These men were distributed as slaves to different groups of Indians and were often separated from each other for long periods of time. The clear record of their movements is of course impossible to reconstruct, for De Vaca himself did not know exactly what happened and could give only an imperfect account of his wanderings and misfortunes in so great and so strange a land.

Dorantes, Castillo and Estévan the Moor seem to have become attached to Indians who traveled westward. De Vaca himself served Indians near the island. He did so because Oviedo and Alaniez were still captive there. Alaniez died finally and De Vaca rescued Oviedo. He says, "In the end I got him to come, took him away, and carried him across the inlets and through four rivers on the coast, since he could not swim."

At first De Vaca was simply a servant to the Indians, but gradually he set himself up as a trader. He discovered that Indians in the interior valued certain kinds of sea shells that had a cutting edge, and that they liked beads and disks cut from shell. Some of these shells had a ceremonial value. From the interior he brought back hides, red ochre paint, flint for the making of arrow points and other articles of trade. Now the Indians treated him better, were pleased with his wares and welcomed him and his news. But he still underwent great hardships and suffered from cold and hunger on his travels. He says he followed this trade because it allowed him to travel and he thought in this way he might escape from the country. "Nearly six years I spent thus in the country, alone among them and naked as they all were themselves."

De Vaca finally worked westward into the region around St. Antonio Bay. For a time he was with Oviedo whom he had rescued, but Oviedo could not stand the ill treatment he received from the Indians and deserted De Vaca and fled. In this region De Vaca unexpectedly came across Dorantes, Castillo and Estévan the Moor. Their Indian masters had come down the river on a food-gathering expedition. There was great rejoicing among the captives for De Vaca had been given up for dead. They planned an escape together. At a certain season of year, about six months after this meeting, it was the habit of the Indians to assemble on the southern Texas plains where they gathered and ate the prickly pears (tuna). They thought this meeting would bring them together again and also offer them an opportunity of escape. They missed one meeting and had to wait for at least a year. But finally they met at this festival and escaped as planned.

De Vaca had already treated the Indians for simple illnesses and injuries, and now such experiences served the party well. They traveled among the Avavares and gained a reputation as healers. They were rewarded with gifts and food and were allowed freedom of movement. In the end, their reputation was somewhat embarrassing to them, for the crowds who followed them about sometimes got out of hand.

After considerable wandering, Castillo saw about the neck of an Indian a small buckle from a swordbelt and a horseshoe nail. He took them from the Indian and questioned him. The Indian said it had come from Heaven and that men had brought it who had horses, lances and swords and who were bearded as De Vaca and his comrades were bearded. So they knew they were approaching territory that had been visited by Spaniards.

Indeed they found that the Indians had suffered from Spanish raids and had been killed and enslaved. But De Vaca finally persuaded them that they had nothing to fear from the

Spaniards. He and his party and eleven Indians set out and finally came in contact with some Spanish horsemen. After so many years alone, De Vaca's meeting with his countrymen was not as pleasant as it might have been. The Spanish party was persecuting the Indians and collecting slaves. De Vaca and his men stood out resolutely for decent treatment of the Indians and the groups finally parted in anger. De Vaca reached Culiacan and Sinaloa near the Gulf of California, where Melchor Diaz was captain of the province. At Diaz's suggestion he made an eloquent plea to the Indians to be no longer afraid of the Spaniards but to adopt Christian ways and to settle and live at peace with each other. From here he went southward across the valley of Mexico and finally sailed for Spain from Vera Cruz. This was in 1536, nine years after he set out for Florida with Narvaez.

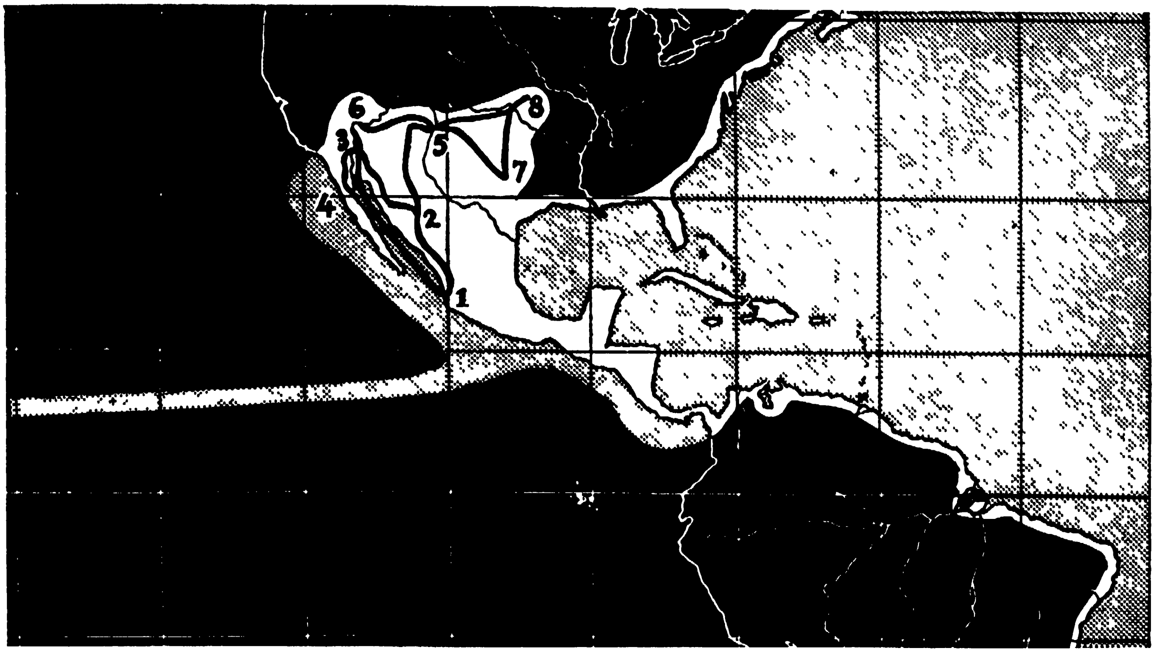
De Vaca had been across America from shore to shore. He had seen the Mississippi River at its mouth and was the first white man to know intimately the lives of the Indians of the southern states and the southwest. He gave the first description of the buffalo. From what he had heard, he reported the existence of the Pueblo Indians and their cities, though he did not visit them. He brought back no exaggerated stories of the wealth of the Indians but his account of this great region aroused people's interest, and probably stimulated both Coronado and De Soto to undertake their expeditions. His own explorations were not ended. We next hear of him thousands of miles away in Uruguay.

FRANCISCO VASQUEZ DE CORONADO
(ABOUT 1500-1547)

WHEN De Vaca and his companions came to Mexico, a stir of excitement passed with them across the land. To be sure, in those days the Spanish settlers in Mexico lived in a state of excitement. There was generally a chain of small explorations and conquests stretching out from the capital. But De Vaca's story was different. He said little about great wealth and riches in the country through which he had passed, but the strange life he lived and vast distances he had covered stirred the imagination. The imagination could do wonderful things even with such slender material as the somewhat vague, second-hand report which De Vaca gave of the Pueblo villages. So there was a new stir of interest about lands to the north of Mexico. It reached Viceroy Mendoza and Mendoza passed it on to Coronado, the new governor of New Galicia.

Coronado had come to New Spain in 1535. He had made a very successful marriage and become a grandee of importance. In 1539 he had just assumed his duties as governor and was ambitious to increase his territory and his wealth. De Vaca had left for Spain but Coronado attached to himself the Moor Estévan, who had been with De Vaca, and a Franciscan monk by the name of Marcos de Nizza who had been with Alvarado in Peru. He sent them forward to make a survey and to report back.

They moved northward with Indian followers and guides. They reached a spot which is now in southern Arizona and sent out messengers in several directions. The Moor himself went northward where it was rumored were the wonderful and fabulously wealthy "Seven Cities of Cibola." The monk had instructed the Moor to fashion and send back a cross which was to serve as a message. The size of the cross was to show the importance and wealth of the country. Estévan, advancing with some Indian companions, no doubt saw from a distance the maize cultivation of the Indians and the pueblos on their cliffs shining in the afternoon sun. He sent back a large cross. He no longer had De Vaca's knowl-



CORONADO'S MARCH TO THE SEVEN CITIES OF CIBOLA AND TO QUIVIRA, 1540-41

(1) From Compostela Coronado marches and Alarcon sails, 1540 (2) Unes (Corazones) where M Diaz and Coronado separated (3) Point on the Colorado reached by Alarcon. (4) Diaz crossed Alarcon's route on the Colorado and dies on western shore of Gulf of California (5) The Seven Cities of Cibola (6) Cárdenas westward to the Grand Canyon. (7) Coronado to the Texas plains, 1541. (8) Quivira (Great Bend, etc), 1541.

edge and judgment in Indian affairs to guide him. He advanced into the pueblo of Zuñi, shouting and singing and waving a dance rattle, a part of the equipment of an Indian medicine man. He was killed for his careless enthusiasm.

In the meantime Friar Marcos, advancing, had received the message and had also acquired reports about the Pueblos which he saw only from the distance. Returning to Coronado and Mendoza, he gave an honest but an exaggerated report of the "Seven Cities." It is quite possible that his experience in Peru led him into an extravagant interpretation of the Indian cities.

Coronado was appointed leader of the expedition and set out early in 1540. He led a small army with Friar Marcos serving as guide. There were 250 horsemen, Spanish footmen, several hundred Indian allies and more than a thousand Negro and Indian servants and camp followers. With a smaller force he went ahead and by July was in the country of the fabled "Seven Cities." The "Cities" were more or less captured but the great wealth not found. Perhaps it was somewhere farther afield?

Expeditions were sent out in several directions so that Coronado's enterprise can be credited with the first exploration of a vast territory. Garcia Lopez de Cardenas in 1540 moved westward until his progress was blocked by the Grand Canyon of the Colorado. Another expedition had reached the Colorado in its lower course and here they came suddenly on an inscription on a tree which said, "Alarcon reached this place; there are letters at the foot of the tree." Alarcon also had been sent out as an adjunct to the Coronado expedition. He had started in ships up the Gulf of California to support the expedition, but had lost contact as the main force moved northward. Another expedition had moved from the Pueblo region down the valley of the Rio Grande and it was here that Coronado and his forces wintered.

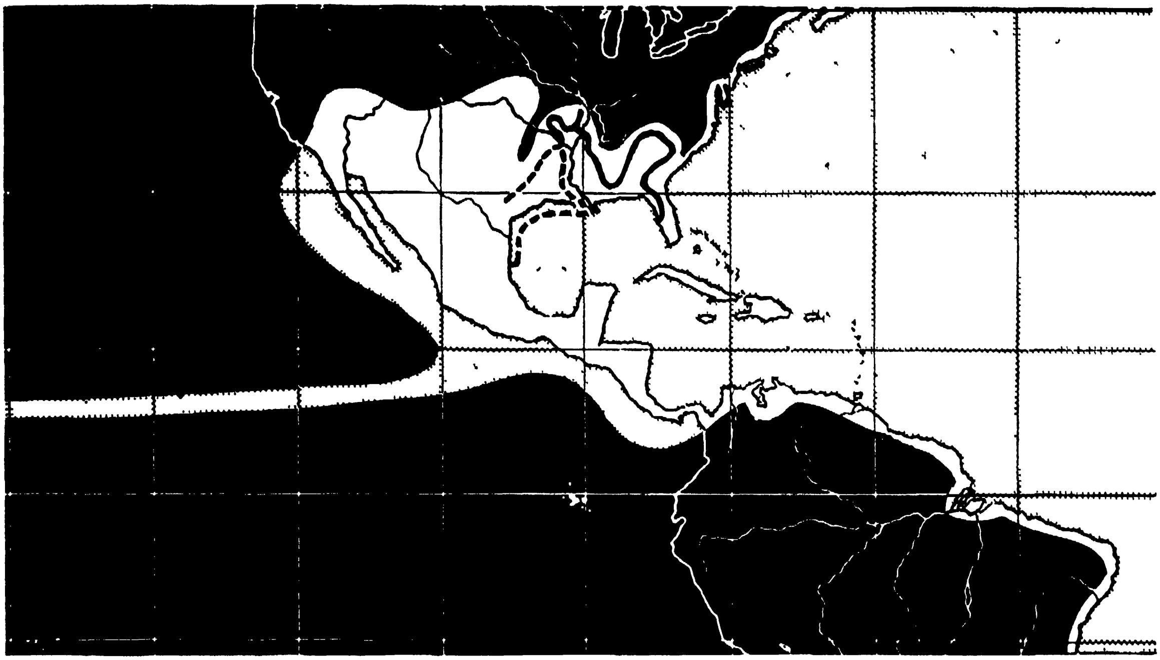
About this time the Spanish captain came in touch with an Indian who was known as the Turk. He was apparently a member of some Plains tribe and was held by the local Indians as a captive. He told wonderful stories of a great, powerful and wealthy people living far away in a vast country. Disappointed in his "Seven Cities" Coronado pinned his hopes on this new fabulous land of Quivira. In 1541, therefore, taking the Turk along, he went down the Pecos River and came into the regions now known as the "Staked Plains." De Vaca had reported buffalo as "hump-backed oxen," but Coronado was the first European to see the vast plains, the buffalo herds and the semi-nomadic hunting culture of the Plains Indians. But the wealthy land still eluded him. The Plains Indians when they were asked about the country of Quivira pointed northward. We are not certain whether they misunderstood the questions of the Spaniards or whether they were simply anxious to be rid of unwelcome visitors.

But Coronado acted on their suggestion. He sent the rest of his force back. He took 30 picked men and the Turk with him and started northward. For 42 days they followed a compass course across the plains and came at least as far as the "Great Bend" country on the Arkansas River. This was supposed to be Quivira. They found only an Indian village—a circle of lodges. Now the Spaniards thought that the Indian, the Turk, had consciously tricked them and misled them.

But Dr. Clark Wissler has pointed out that there is a different and quite probable interpretation that can be put on this strange incident in the history of exploration. It is possible that the Turk acted in ignorance but in good faith. He had intended to bring the Spaniards to an important Pawnee village—for among all the Plains Indians the Pawnees were known far and wide for their accomplishments. They were brave in battle, judicious, crafty. They made the most beautiful songs and chants, they had famous "bundles" and controlled powerful "medicines"; that is to say, they were the poets, philosophers and scientists of a vast area. The Turk would have little understanding of Coronado's thirst for gold but he understood clearly enough that the Pawnees were a great and powerful people.

There is something impressive and dramatic about the weary Spaniards, with the hunger for gold and power gnawing at their hearts, riding so far to dismount at last before these dusty low houses where the placid Indians sat, secure and confident in their own power and in their traditions. In silence, two opposed philosophies confronted each other. Coronado, who had no interest in philosophical contrasts, executed the Turk for his pains and turned back to the Pueblos with a heavy heart.

He rode back in a southwesterly direction, picked up the main body of his forces, passed through Cibola and returned to Mexico along the shores of the Gulf of California. His return had about it something of the air of a retreat. He was sad, weary and ashamed. Under his direction a great section of the American continent had been explored and had come to life. He had seen the Pueblos, had ridden across the great plains, had been the first man to see the life of these regions. His men had looked for the first time into the Grand Canyon of the Colorado, that scar in the earth that like a human wound tells so much of its bearer's history. Yet because gold was lacking, he felt that there had been nothing to reward his search. He gave up his governorship of the province in 1542 and retired for the rest of his life to an unbroken obscurity.



DE SOTO'S WANDERINGS IN THE SOUTHEAST, 1539-1542

Moscoso after De Soto's death 154

HERNANDO DE SOTO (ABOUT 1496-1542)

DE SOTO lived to see an extraordinary amount of the New World. He was in Central America and Peru and he explored the whole southeastern section of the United States. He matched in the southeast the discoveries that Coronado carried out at the same time in the southwest.

Like so many other Spanish explorers he came from Estremadura, and he knew in his time most of the great men in America. He was related to Dávila and went with him to Darien. Here he saw Balboa and Pizarro. It was to assist Pizarro that he went to Peru. On his return to Spain he married one of Dávila's daughters and so became a man of wealth and a noble. Like seasoned timber, he was ready to take fire when the story of De Vaca's vast discoveries reached Spain. Indeed he sought De Vaca's assistance but De Vaca wisely refrained from going. He had suffered enough under Narvaez.

De Soto sold his property, assembled a force of 600 soldiers and loaded them all on 7 ships and in April, 1538, sailed from San Lucar to Havana. In May of the following year he landed near the present city of Tampa, not far from where Narvaez had first touched the Florida coast. He began then four years of wandering in which he led the dwindling army of his followers on a long and fruitless struggle through the American wilderness, seeking always for gold and for a prosperous civilization. Though his company never found gold, they had hardship and adventure enough to satisfy any army of heroes. With the Indians he had many varied experiences, finding some friendly, at least at the start of their acquaintanceship. But for the most part he encountered Indian hostility and, in addition to the difficulty of having to find trails and to cut roads suitable for his large company, he had to be continually alert against Indian attack.

He had not been long in Florida when there was added to his forces a remarkable and romantic figure. Three Indians approached the camp. They were about to be shot when one called out in Spanish. He bore himself like an Indian, was equipped like an Indian and at first glance looked like an Indian. In fact this man was a Spaniard, Juan Ortiz, who had been a member of Narvaez's expedition. Like De Vaca he was at first a captive and later made a place for himself in the Indian community, making the best of a poor situation. He had lived among them for 12 years.

In his earlier adventures De Soto had shown some flashes of understanding of the Indians and pity at the treatment they were receiving at the hands of the Spaniards. He had protested against Dávila's methods and had objected to the execution of Atahuallpa. But on his own expedition he showed a different character. Oviedo, the historian, said of him: "This governor was very fond of this sport of killing Indians." As he moved on his line of march his procedure was to live off the Indians as much as possible. He would seize the chief of a tribe and hold him hostage while the expedition moved through his territory. He would then seize a second chief and release the first. Ordinary Indians in great number he held as guides, servants and slaves. Those that rebelled were shot, those that moved with the Spaniards died of exhaustion.

In this way De Soto moved northward through Florida, working his way across streams and everglades and around lakes. A division of the company, under Añasco, finally discovered the port where Narvaez had built his ships and from which he had embarked. They found circles of ash where the fires had been built, the abandoned forges rotting in the damp and now overgrown with vines, the bones of the horses whitening under the southern sun.

In 1540 De Soto left Florida and moved northward and eastward well into the territory of Georgia. He seems then to have made a bend through parts of North and South Carolina and to have turned southward and westward until he reached a territory called Mauilla (Tombigbee and Alabama rivers). Mauilla may be a version of our name "Mobile." Here a great battle occurred, the Indians anxious at any cost to be rid of the Spaniards. Eighteen of De Soto's men were killed and about 150 wounded. But the horses and the firearms and the burning of villages finally terrified the Indians. If the reports are to be at all believed, between 2,000 and 3,000 Indians were killed. The Spanish force itself was now rapidly dwindling in numbers. It had lost equipment also. It was dispirited, worn out with apprehension and fatigue, ready to give up and return home. There was no gold or wealth in all this land!

But De Soto was not ready to give up. He did not want to face the return to Spain with a record of defeat behind him. He knew he was near the Gulf and deliberately turned away so none of his men could desert to the ships. He made a long march northward and westward, battling Indians all the way, until he reached the Mississippi River in the neighborhood of the Chickasaw Bluffs in 1541. Here he crossed the river and followed its west bank northward. Still disappointed in his hope of finding the promised land, he turned south and west and on a branch of the river he spent a miserable winter. Men had been dying all along the line of march to the number of at least 250. In this winter camp Ortiz sickened and died.

Now even the leader admitted defeat. He decided that hope lay in a plan to push southward to the Gulf, to build two brigantines and try to reach Cuba. It was April, 1542, when the dispirited band reached the mouth of the Red River. Here De Soto fell ill of a fever which dragged on until the middle of May, when he died. He was at first buried in the village encampment, but the Spaniards were apprehensive. They did not want the Indians to know of the fate of their leader, for De Soto had led the Indians to believe that Spaniards were immortal. Now they feared that his corpse might be dug up. Some of his followers, taking a canoe, put the body aboard in the middle of a dark night and paddled out into the Mississippi. They weighted the body, slipped it overside as quietly as they could and let it sink beneath the yellow, rushing waters of the great stream.

Shea says: "The Adelantado of Cuba and Florida, who had hoped to gather the wealth of nations, left as his property five Indian slaves, three horses, and a herd of swine."

But this was not quite all he left. He left a reputation for resolute character and determined leadership. Compared to De Soto's march we can see how futile was Narvaez's effort. De Soto carried on long after another man would have acknowledged defeat. The records of Spanish and Portuguese exploration are full of stories of mutiny, rebellion, fratricidal quarrels between brother officers and division of forces. Nothing of this sort happened to De Soto. His men may have quarreled, they may have protested, they may have formulated plans to part with him, but these things were of no effect. He kept his leadership and his band stuck with him to the last, through a four-year odyssey of agony and disappointment.

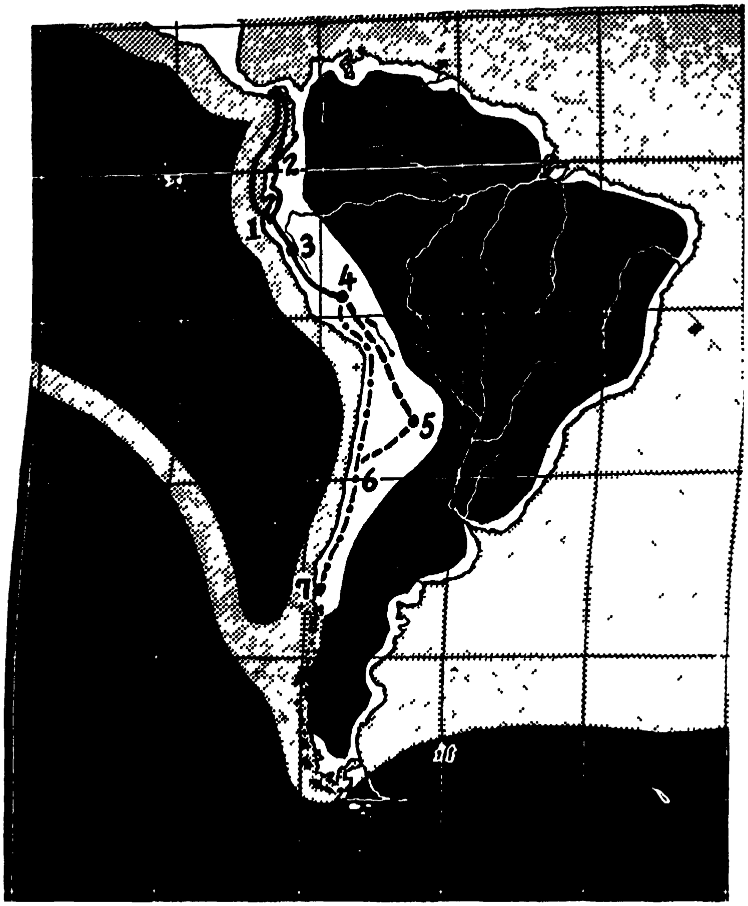
In his illness De Soto knew he was to die. Long ago it had been predicted by a soothsayer that he would not live to be older than Balboa, who had died at about 42 years of age. The time had come! Weighted with his superstition, De Soto still made sensible plans for his followers. He arranged to conceal his death from the Indians, and he selected the determined Luys Moscoso as his successor.

A council was held and Moscoso decided to lead the band westward into Mexico. He came to the region of the Brazos River and found the country poor and food scarce. He decided therefore to return to the Mississippi and to build brigantines for a sea voyage down the river to Mexico. This plan they carried out, but the winter of 1542-3 was spent in miserable quarters in the river flats. With great ingenuity and many days of patient labor, they contrived 7 brigantines. In the spring they nearly lost their vessels and their habitations in a characteristic Mississippi flood. In mid-summer they carried out a 52-day voyage down the river and along the Gulf until they reached the river and settlement at Pánuco (Tampico) in Mexico. They arrived there, having eluded the pursuit of hostile Indian bands, having lost 12 men by drowning and having passed through a storm which scattered the fleet. About 300 men reached this point as survivors of the De Soto expedition. In Mexico, in the other Spanish settlements, they had long ago been given up for lost.

FRANCISCO PIZARRO (ABOUT 1471-1541)

PIZARRO was the left-hand son of Colonel Gonzalo Pizarro and was born sometime between 1471 and 1475. The Colonel had made a socially successful marriage, but it was a dark-haired, bright-eyed peasant girl who presented him with most of his children. He acknowledged the children and gave them his name and a taste for military adventure. But of money and of education they had little enough. When Pizarro and his associate Diego de Almagro came to draw up with a third partner the agreement by which they divided the richest empire of the New World, neither of them could read or write or sign their own names.

Pizarro drifted to Seville where he picked up the current stories of the New World that was part of the cargo of each returning ship. This led him across the sea to serve with Ojeda in Central America and to march with Balboa to the Pacific.



THE ADVANCE DOWN SOUTH AMERICA

(1) Tumbez first reached by Pizarro in 1527 after coasting by slow stages (2) Where Pizarro landed in 1531 Marched to Tumbez (3) Cajamarca, 1532 (4) Cuzco, 1533 (5) ------ Almagro, 1535-37. (6) ——— Valdivia to Copiapo (7) Valdivia Harbor, 1552

For years Pizarro had been hearing the stories of wealthy lands that were to be reached by embarking on the "Great South Sea" and following the coast toward the south. In 1524, he made an arrangement with a fellow soldier from Trujillo, Diego de Almagro, and a priest named Hernando de Luque, by which they were to form an exploring company. By this agreement the three partners were to divide equally the profits resulting from the conquest. But their duties were to be very dissimilar. De Luque, who was acting for the licentiate Espinosa, provided the majority of funds and he was to remain in Panama as agent. Almagro was to maintain communication between Pizarro's advancing forces and Panama. He was to bring up supplies and arms. Pizarro himself was to lead in the discovery and conquest.

In pursuit of this plan Pizarro sailed in the fall with one small vessel. The Indians had said it would take a thousand men to conquer the rich land, but Pizarro set off with 80 men and 4 horses. This was the beginning of a slow and confused advance that lasted for three years but finally carried him as far as the Inca city of Tumbez.

The expedition remained undermanned and never properly equipped. Much time was spent by Pizarro and his band waiting in the harbors of an inhospitable coast while the vessels returned to Panama for reënforcements or supplies. One of their early ports they christened *Puerto de la Hambre* (Hunger Harbor). While they waited here, 27 of the 80 men died. Their subsequent ports were little better—there was no evidence of the wealthy empire they had come to find. On marches under the hot sun their armor became incredibly heavy, they bruised their feet on rocky trails, they sunk to their thighs in the black mud of the marshes. In the steaming air their clothes rotted, their hats mildewed and fell to pieces. Shut in by the forests, the mosquitoes stung them to distraction; out-numbered by the Indians, many were wounded.

Almagro returned to Panama and was appointed by Dávila joint-commander with Pizarro. Pizarro was naturally offended as Dávila intended him to be. In this act Dávila not only expressed his deep displeasure at the losses the expedition had sustained but he also confirmed his extraordinary talent for creating nasty and intolerable situations. Before Peru was even sighted, Dávila had sown the seed that was to blossom in civil war.

On Almagro's return the expedition advanced a little farther down the coast near the River San Juan. Here Pizarro was again left waiting while he and his men patiently endured the tropic downpours, sickness and hunger and attack by the Indians. Fourteen men died. Almagro was in Panama finding it more and more difficult to raise recruits and supplies.

In the meantime Bartolomé Ruiz with the other ship was sailing farther down the coast. He captured some Indians who were navigating a raft and from them learned of Tumbez and of the Inca and of the wealth of the great city of Cuzco.

This time when the ships and the men reassembled, they advanced together to the Island of Gallo. There was now an open quarrel between Pizarro and Almagro. Dávila had been replaced but this was of no benefit to the expedition, for the new governor decided to intervene and sent a vessel to bring back all the men who wished to return to Panama. Pizarro made a stirring speech saying that he intended to remain and to pursue his advance even if all the others sailed away. With his sword he drew a line in the sand, stepped across it and invited all those who wished to share with him the glory and wealth to be won by capturing the Peruvian empire to step across and join him. Out of the company about 15 men stepped across the line. The rest returned with the vessel to Panama. This little handful of men that hid with Pizarro on an uninhabited island were to initiate the discovery and conquest of Peru.

After months of waiting, Almagro finally returned with a vessel but without reënforcements. He had however persuaded the governor to give the expedition a six months' lease of life. They sailed on and 20 days later came to a little island opposite Tumbez. Here they saw their first Peruvian city—the beautiful stone work of the temples, the idols, vessels of gold and silver, cloths and tapestries rich in design and blazing with color. Pizarro exchanged his gifts with the Lord of Tumbez. A Negro who went ashore with gifts attracted much attention. The Indians tried to wash the black color off him. He bore this with patient amusement, grinning and showing his white teeth.

One of Pizarro's followers went ashore and walked through the town in armor to the amazement of the natives. He came back equally amazed at the completeness, the civility, the wealth of the town. But this the Spaniards were told was only the beginning. In the interior there were scores of larger and wealthier cities, with Cuzco the great capital.

Pizarro returned to Panama and in 1528 went to Spain where he was received at Court and announced his discoveries to the King. He was given the title of Adelantado and was assigned the government of Peru, a country that was defined as extending 200 leagues up and down the coast. De Luque was made Bishop of Tumbez. Pizarro returned to his native town and there collected his brothers, Juan, Gonzalo, Martin and his half-brother, the legitimate Hernandez. They sold their property and started with him on a new expedition. There was difficulty about complying with all of the King's requests. So they sailed secretly, sneaking out of the port of San Lucar.

In Panama it was Almagro's turn to be discontented. He resented the presence of Pizarro's brothers and he charged Pizarro with having neglected his interests at Court. Through the intervention of friends, the quarrel was patched up, Pizarro agreeing to renounce the title of Adelantado and to seek no new honors until Almagro was also given a government.

At the end of 1530, the expedition got under way again with 3 small ships, 180 men and 37 horses. They sailed to the Bay of San Mateo and found the Indians in arms against them. They took a town, capturing great quantities of gold and silver and many emeralds. They sent the ships back with this evidence of their success, praying at the same time for further reënforcements. Seven months they waited, suffering from disease, before the ships returned with about 60 additional horsemen and foot-soldiers. They advanced along the coast to the Island of Puna. Here they attacked and inflicted great losses on the Indians. They advanced to Tumbez which they captured.

In the spring of 1532, Pizarro started southward. Almagro, partly faithful, brought up supplies. But men he would not furnish for he was intending to conquer and colonize on his own account. At the same time Pizarro had heard reports that 10 or 12 days to the south there was a populous valley with a city called Cassamarca (Cajamarca, Caxamarca). There was the great Inca Atahuallpa. In the fall Pizarro began his march. Halfway there messages and friendly greetings and gifts reached him from Atahuallpa. In lordly terms Pizarro acknowledged the greetings. There must be an alliance between them or a fight between them—he continued his march. Amid protestations of friendship on both sides, he entered Cassamarca in November. De Soto with 20 men was asked to carry a message to Atahuallpa's camp and to extend an invitation to the Inca to visit Pizarro. The Inca delayed. Alone, Hernandez Pizarro repeated the message. The Inca delayed. Finally with 5,000 to 6,000 men said to have been unarmed, Atahuallpa entered the town. There were speeches on both sides. At a signal from Pizarro, the cannon that had been stationed about the native fortress were suddenly discharged, the horsemen attacked, and in an instant the peaceful meeting was transformed to a scene of bloody carnage. Pizarro received a slight wound which was the only casualty on the Spanish side. Two thousand Indians were killed. Atahuallpa was taken prisoner.

In the room in which he was imprisoned Atahuallpa reached up his arm and made a mark upon the wall. As a ransom, he promised in two months' time to fill the room with gold up to that mark. Soon the gold began pouring in. The collected gold finally amounted to 1,326,539 *pesos de oro*. This has been said to represent a valuation of 15½ millions of dollars, but this estimate is probably too high. None the less, with the addition of upwards of 51,610 marks of silver, it represented a ransom which had never been equalled in the world's history.

The Spaniards were drunk with gold and with power. They fought and raided and plundered. The division of the gold increased the hostility within their own ranks. Despite the ransom which Atahuallpa was paying and which was so much greater than the Spaniards ever expected to see, an occasion was found for bringing the Inca to trial. It was decided that he was to be burned to death unless he professed himself a convert to Christianity. Just before the execution was to be carried out he made what passed for a profession of faith and then was graciously strangled to death with a bow-string.

Pizarro ruled in Peru. The King confirmed his government and in 1535 he founded the city of Lima. All would have gone well had not his old partner Almagro been hanging on his flank, disturbing the peace—Almagro and the discontented ones and the revolted Indians. Almagro claimed Cuzco as part of his territory. He gave it up for a time and launched himself on explorations in Chile. Disappointed here, he returned and fell on Cuzco, captured Pizarro's two brothers and ruled the city. When the brothers were released, they recaptured the city and Almagro was condemned and strangled. But not even his death could end the old feud and in 1541 a band of his followers attacked the Marquis Pizarro. He might have known there was trouble coming, but he sat in his council chamber with some of his officers, apparently oblivious of his fate. The faction of Almagro rushed in and in the confusion the men about Pizarro fled. Despite his 70 years, he grabbed up his sword and dispatched three or four of his enemies before he was cut down.

A Note on the Incas

WHEN Pizarro let go the anchors before Tumbez, the Incas were ruling a vast and highly developed empire. It was much greater than the country which is now Peru. It stretched from Ecuador in the north, well into Chile in the south, contained 380,000 square miles, or as Means has it, "about as much territory as is included in all the Atlantic seaboard states of our country."

In this territory lived a numerous and prosperous people. There is no need to speak of their prosperity for we all remember the wealth of Peru. We remember also their architectural and engineering triumphs —the striking and beautiful cities like Cuzco or Ollantaytambo and Machu-Pichu; the beauty and strength of their masonry-buildings; the excellence of their system of irrigation; the splendid roadways that bound the empire together; the elaborate masonry and suspension bridges that carried these roads over gorges and precipices. The central road that ran for 1,500 miles should probably be reckoned along with the Wall of China as one of the most remarkable of men's engineering developments before the invention of machinery. An ingenious system of store-houses along this road permitted armies to be moved at great speed. Along the road also existed stations for messengers who relayed and signalled news from city to city with unexpected speed. A recent investigator has asserted that persons and messages could move from Cuzco to Quito in the time of the Incas about as rapidly as they could in 1914.

Nor were artistic developments lacking. The wealth and variety of Peruvian potteries is a by-word. The ingenuity of manufacture, the beauty of color and variety of design of Peruvian fabrics, place them among the important examples of textile art.

These things we remember but what we are apt to forget is that the wealth, the engineering and art would hardly have been developed to such an extent without the existence of a remarkably strong and thorough-going social organization. Over the great territory that we have described the ruling family of the Incas extended a strong, rigid, but on the whole benevolent, government. Under the Incas all phases of life were completely organized. That organization approached a form of centralized state socialism, but of course without any democratic features. Radin prefers to call it a "monarchical theocratic community" or again "one of the most remarkable examples of a bureaucratic-socialistic despotism of which we have any record." Whatever we may call the system it was developed in a logical and thorough fashion. Through a series of graded officials it reached from the Inca to the least important member of the last little outpost hamlet of the empire. Despite the completeness and rigidity of the government it contained many elements of sound human insight. While under the system most of the wealth accumu-

lated in the hands of the Inca family and the priests, it was also true that every individual had a definite place in society and definite duties to perform for the state.

While no doubt the lower classes worked hard, there was at least always work for them to do. In exchange for this the Inca protected the population against emergencies and disaster. If crops failed in any district the population was fed from the Inca's store-houses or from those which were the property of the sun god and controlled by the priests.

This political system was the distinctive contribution of the Inca or Quechua people. The Inca empire was made up of many local civilizations that were old and well developed. It included scores of different tribes and language groups. These contributed many of the arts and industries to the empire. But it was the Inca system that bound them together.

The success of the system therefore depended in a great measure upon the skill and insight of its colonial system. It is not possible to explain that system here, but it is well worth the attention of all students of colonial politics. It had many liberal and intelligent features. Had Spain developed as intelligent a system, the course of her history might well have been changed. Means says, "There can be no doubt, I think, as to the relative practical merits of the Incaic system in Peru and of the Spanish colonial system which followed upon it. No one who examines the evidence regarding the two can fail to arrive at the conclusion that the subjects of the Incas were more free from oppression and misery than were their descendants under the Hapsburgs and the Bourbons." The Inca territory supported in those days twice as many inhabitants as it does today.

Had Pizarro had any education or wit, he might have preserved for Spain intact a wealthy, highly organized nation of healthy and vigorous people. He measured the wealth of a country in terms of booty, solid gold and silver that could be shipped back to Spain. For him an Indian population had no continuing life of its own, something that could bring prosperity generation after generation; it represented only so many individuals that could be made converts and servants.

Cortés missed his chance in Mexico; Pizarro missed his chance in Peru. Each had sufficient determination and avarice to wreck a wealthy empire. Neither had the capacity to retain even the material advantages they had snatched. Cortés rushed to his ignominious oblivion in Spain. Almagro and Pizarro stumbled blindly into their quarrels of mutual extermination.

There is about Pizarro a kind of dogged endurance, a capacity for overcoming obstacles and a shining personal courage. But a great part of the romance attached to his name is inherently the romance of the people whom he discovered and ruined. Seen from one point of view, Pizzaro and Cortés are great figures because they conquered great people, but change the angle of vision slightly and the very richness of the background against which they appear shows them as tragically inadequate figures.

DIEGO DE ALMAGRO (1475-1538)

AFTER Pizarro had established his power in Peru, the envious and disgruntled Almagro turned his attention southward. He began his short and disastrous career as an independent explorer. His faction of the Peruvian conquerors gathered around him. They in turn rounded up a great horde of Indians and they started south from Cuzco in the hope that another land as rich as Peru lay before them.

Now there were two Inca roads that ran from this point south, one of them following the coast line and the other running inland through the mountains. It was Almagro's misfortune that he was either misdirected by Indian guides or he deliberately chose to pursue the mountain road. He and his Spaniards were hurried, impatient, ignorant of the country. Thanks to the great engineering skill of the Incas they moved for a while over well-prepared roads with dizzying but secure bridges. But gradually the going became more and more difficult. The men were awed by the stupendous mountains and they were weary with the continuous ascents and descents, for their horses failed them. It grew colder and colder and the snows came down over the road. Their strength ebbed and they froze. Nothing could be done for the relief of the ill and exhausted. Men and animals had to be left where they happened to fall. A record is preserved of Geronimo de Alderete who six years after Almagro's passage went again over this mountain road. At one point amid the vast frozen silence of the great ranges, he came on the body of a Negro servant standing upright, leaning a little against the rocky cliff that formed the side of the road. He was perfectly preserved and in his hand the Negro still held the rein of the bridle of the horse he had been leading. The horse also was frozen upright against the cliff. So cold are these mountain regions that it is said that recruits who tried to join Almagro five months after his passage cut meat from the bodies of the horses that had been abandoned on the way. They found it frozen solid and as fresh as the day on which the animal had died.

In crossing the Atacama Desert, Almagro showed great skill as a leader and as a traveler. He knew that water in this region was to be found at rare and infrequent intervals and that supplies of it were easily exhausted. He therefore divided his forces, sending them across the desert in small groups so that water supplies might be replenished between the passage of the different detachments.

At the end of a journey that cost the lives of 150 Spaniards and 10,000 Indians Almagro, having left the richness of Peru, came to a land that was barren and unproductive, inhabited by sturdy and hostile Indians. He turned his back on the country and fell on Cuzco and bitter civil war.

PEDRO DE VALDIVIA (1497-1554)

PEDRO DE VALDIVIA was not only the explorer of Chile but also the founder and ruler of Spanish settlement in that country. In Valdivia we see a clear and uncomplicated picture of the virtues and the shortcomings of the Spanish explorer and conqueror. He was a fighter all his life, a plain, brave, direct old warrior. He was above the average Spanish leader in intelligence, heroic in his loyalty to his king, his country and his religion. His limitations revealed themselves in dealing with the Indians.

Valdivia came from the province of Estremadura to follow his fellow provincials, Cortés and Pizarro, into the New World. Somehow he got there and served Cortés in Mexico until 1535, when alarming news arrived from Peru saying that the Incas had revolted against the Pizarros. He was sent to Peru with a relief expedition.

Five years later Valdivia planned his expedition and conquest of Chile. In these five years he had won the confidence of Pizarro and had his support in the undertaking. One Pedro de Hoz had been sent out from Spain to lead this expedition, but Pizarro placed his chief confidence in his associate-in-arms. He said farewell to the Marquis Pizarro in January, 1540, and with 150 soldiers and two priests accompanying him, marched by the coast route to the valley of Copoyapo (Copiapó). He crossed the great desert and wilderness of Atacama with relative success.

In Valdivia's mind the name Chile had an evil association because of Almagro's hardships and his turning back. So Valdivia wrote to the King that he preferred to call the country Nueva Extremadura. He called the pleasant valley of Coquimbo, "El Valle de la Posesion," possibly because in this valley alone was he able to establish safe and complete conquest. In 1541 he founded the cities of La Serena and Santiago, but from then on he was involved in a continual series of Indian wars and his successors were compelled for over a century to carry on battles against the Araucanians. These Indians were a fine, upstanding, intelligent people. Perhaps they were not initially organized, aggressive and warlike, but they soon learned what treatment they had to expect from the Spaniards and developed the qualities that they needed for the defense of their pride and honor. Even the Spaniards who fought against them thought of them as competent and valiant foes. They never gave up the struggle as long as there were warriors left among them.

Valdivia himself had much to do with the character of this resistance. His rule was harsh and in the mines and on the farms he expected continuous servitude from the Indian population. For example, in 1550 on one of his excursions, Valdivia captured 200 prisoners. He felt, probably quite honestly, that the population had been recreant in its service to the Spanish king and religion. He meant to teach a little lesson in civilization and Christianity, so he cut off the hands and noses of these 200 captives.

But he was indefatigable in his activities. He never spared himself or his followers in an effort to explore or to colonize. In 1544 when Bautista Pastene sailed the Chilean coast southward, Valdivia joined him at Valparaiso and established a port there. On other voyages, ports were established at Valdivia and Callao.

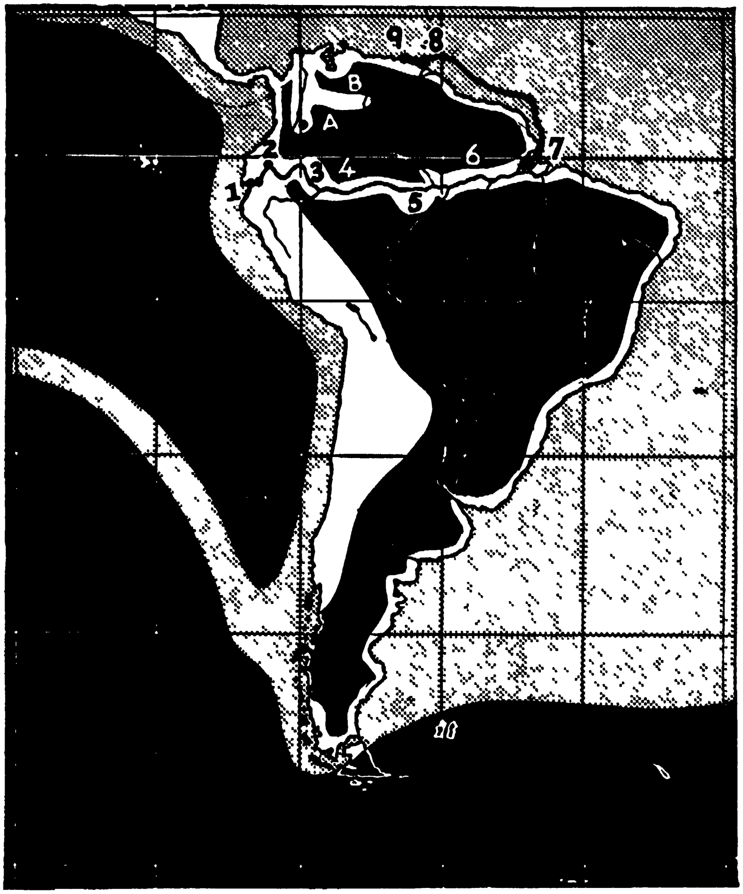
When he was not fighting in Chile he was fighting in Peru, for in 1547 word came to him that Gonzalo Pizarro and his followers had revolted against the King's appointed governor. At great expense and under great difficulty Valdivia returned to Peru to espouse an unpopular cause and to defend the Crown. He was a great aid to the cause but was dismissed with scant thanks either from the governor or from the King. In 1549 he hastened home to defend his own settlements. Here the Indian resistance had grown formidable. In 1553, the Araucanians made a successful attack on the outlying fort of Tucapel. The attack owed part of its success to plans formulated by Lautaro, a young Indian who had been a personal servant to Valdivia but had sickened of his methods and returned to his own people. Valdivia rode to the defense of the fort with 50 horsemen but came late and underestimated the strength and skill of his opponents. The Spaniards at the fort had already been killed. Valdivia and his horsemen were caught wallowing in a swampy river bottom. The soldiers were exterminated. Valdivia and a priest who was riding with him, already suffering from countless wounds, were dragged to an Indian camp and executed.

FRANCISCO DE ORELLANA (1511-1546) CROSSES THE ANDES AND FOLLOWS THE AMAZON TO ITS MOUTH

PERU had hardly been conquered before the Spaniards started a new series of expeditions using this country as the base. Gonzalo Pizarro, who had come out with his brother and under him was governor of the district of Quito, started one of the most important of these ventures. Under torture he had extracted from an Indian the story of a rich country called La Canela—"the land of cinnamon trees." This lay eastward, across the high Andes, and further away still there was the land of El Dorado, the "Gilded Man." Pizarro determined to organize a large expedition and go in search of these countries.

There volunteered for this expedition a man of great energy and enterprise and still a kindly man, one Francisco de Orellana. Like the Pizarros, Orellana came from Estremadura. These Estremenians were an unusual group. They provided about half of the important explorers of Spanish America; they were capable of the most astonishing feats of endurance, of the most courageous fighting and of the most persistent feuds.

Orellana was younger than the Pizarros, but he had come in time to take part in the conquest of Peru and had founded the city of Santiago de Guayaquil. When Pizarro started on his great venture, Orellana worked furiously to organize a party and join him.



ORELLANA ACROSS THE ANDES AND DOWN THE AMAZON

(1) Leaves Guayaquil, February, 1541. (2) Quito (3) El Barco camp on the Napo River First brigantine built December, 1541 (4) Aparia the Great Second brigantine built February April, 1542 (5) Paquana's domain (6) Province of Gibbets—Carvajal shot in the eye. (7) Island Caribs Repair vessels Leave river August, 1542 (8) Sailing Atlantic, ships separated by storm. One trapped in Gulf of Paria (Trinidad) (9) Arrive at Isle of Margarita, September, 1542

QUESADA IN NEW GRANADA. A. Bogotá, 1536 37 B To Orinoco, 1569.

This was in February, 1541, and Pizarro's preparations had then been going on for some time. He had assembled over 200 Spaniards and had provided an equal number of horses. He had 2,000 hogs, an equal number of dogs and a whole herd of llamas. Just as he might collect the animals, he had collected and chained 4,000 Indians to use as servants and slaves on the expedition. This great caravan started for the mountains with great enthusiasm and rejoicing, but before they had traveled 30 miles they had come to stupendous ravines and passes winding between snow-covered mountains. As a foretaste of what was in store, 100 Indians perished from cold. The party moved with great difficulty over the great mountain chains. They came to river chasms, over which bridges had to be constructed. As they pushed upward, men and animals gasped for breath, became exhausted and dropped by the wayside. Some slipped from the trails and were lost in the chasms. By the time they reached Zumaco the expedition was forced to rest and recuperate.

Meanwhile, Orellana and his forces had been hurrying after the main expedition. Setting out from Guayaquil, they passed through Quito and hastened on. They had to fight with hostile Indians who had been stirred up by the passage of the main expedition, they lost part of their equipment and their food supplies and were in a sad state when they joined the others at Zumaco.

While Orellana recovered at Zumaco, Pizarro decided to take a small force and investigate the Cinnamon Country. In the tremendous forests and on the steep mountain-sides horses were useless, so his 80 men went afoot. It took 70 days of desperate marching to bring them through this region.

The wealth of the Cinnamon Country proved to be a delusion. In his wrath Pizarro began to torture and abuse his Indians, trying to squeeze from them the secret of the hidden wealthy country. All that he got was a repetition of the El Dorado story.

He reached the upper waters of the Napo River and ordered Orellana and the rest of the expedition to join him there. The attempt to follow the banks of the river proved incredibly difficult. There were not enough canoes to provide transport on the river so it was decided to build a vessel.

The whole party encamped at a spot which they named El Barco and here they constructed a brigantine. The ship was probably not a very good one but that they succeeded in building a ship at all is surprising. They had made no provision for such an undertaking and all the materials that went into the vessel had to be improvised. Even the nails had to be made from such scraps of metal as they had with them.

A ship was launched on the jungle-stream but it could accommodate only a small part of the expedition and even with its help, progress was slow. The party ashore wallowed through swamps and morasses for 43 days and many animals and men were drowned. They were traveling through a region that had no Indian life and no food and their own supplies were exhausted.

Then they halted and it was agreed that the main party should wait while Orellana took the brigantine and went down the river in search of food. Fifty-seven men went with Orellana, including Father Carvajal who has left an exact account of the whole expedition. The men were sick and feeble with hunger and dispirited. They had almost no supplies and only a few arquebuses for arms. The vessel in which they were traveling, an improvised affair, was hardly safe even for inland waters and before they had traveled a day a bottom plank was stove in and had to be hastily repaired. Yet in this vessel Orellana navigated and explored the whole length of the Amazon River and made the first crossing of the South American continent.

This extraordinary crossing of a continent is not very well known and Orellana has only recently received the recognition that is his due. Indeed it has been charged that he was a traitor and a coward and that he deserted Pizarro in a time of need. Most of the Spanish historians followed the prejudiced version of the story given by Pizarro, and later writers have followed the Spanish historians.

Yet it is clear from Father Carvajal's account that Orellana on the trip showed extraordinary courage and competence and that, if he could have, he would have gladly followed Pizarro's orders and discharged his own responsibilities to the main expedition.

The truth is, that once launched on the swiftly flowing stream, the brigantine was swept rapidly onward. Carvajal computes that they traveled 70 to 90 miles a day, and that in the first nine days' travel they moved about 730 miles. The good Father may have exaggerated the distances, as nearly all voyagers in unknown country tend to do. Even allowing for exaggeration, they moved fast and far. The reason they did not make an earlier attempt to turn back was that they traveled through an uninhabited country and found no food to bring back to the main expedition. They themselves starved. They ate their leather belts and even the soles of their shoes. Later, so weak that they could not stand, they crawled into the forests on hands and knees and grubbed for food, some of which turned out to be poisonous. Only the steadiness of the Friar and the cheerful guidance of Orellana brought them at last to their first stop at an Indian village.

Though greatly outnumbered, and with only three arquebuses and a few crossbows as armament, they attacked the village and took from it the first food they had had in days. They were then so far from the main party that to work their clumsy ship up-stream was virtually impossible and in canoes they could not have carried, even if they had had it, enough food to be of any service to the main party.

Orellana tried his best to find a method of sending word to Pizarro. When this was demonstrated to be impossible, he turned his attention to the salvation of the party for which he was then solely responsible. He could hardly have guessed the tremendous undertaking that lay before him and he wisely decided to follow the course of the river.

For this they needed a new ship and in this village, Aparia the Little, they made 2,000 nails before hunger compelled them to move on. Farther down the river at the village, Aparia the Great, they completed the construction of a second and better brigantine.

They continued the trip in the two vessels. Week after week they went on, encountering a few friendly villages but mostly hostile ones. Sometimes they were swept down the river for days at a time in a state of semi-starvation. When they could stand the hunger no longer they threw themselves on a village no matter what the odds, driving out the natives and fighting their way to the food supplies. Father Carvajal gives a very vivid description of the trip, noting not only their adventures and trials but describing also important geographic features; the mouth of the Trinity River (Juruá) and of the Rio Negro (named by Orellana), whose dark waters run for miles without mingling with the lighter waters of the Amazon proper. He notes also the character and condition of the Indian life at various parts of the river. The lower river was then heavily populated and he describes many Indian settlements that stretched out for six or seven miles along the banks. The fleeing Spanish ships were often pursued by whole fleets of Indian canoes. At one village they came upon women who fought against them. They refer to these women as Amazons and it is from their accounts of this occurrence that the river derives its name.

During one of the attacks by the Indians Father Carvajal was shot through the head by an Indian arrow and lost an eye. Had he been hit several days later, he would have lost his life as well, for they then entered territory of Indians who used poisoned arrows. Two of the Spaniards died from such wounds.

One day they noted a rise and fall in the river and concluded that it was due to tides and that they were near the end of their journey. Yet so great was the stream that they were still 300 miles in a straight line from the true mouth of the Amazon. On islands near the mouth of the river they fought off the Indians and drew up their ships to be repaired. Again they had to improvise materials, using vines for their rigging and cutting their blankets up to make sails. When the patching and rebuilding was done, though they had no pilot, no chart and no compass, they had to risk a passage on the open ocean in the frail craft which they had built. After a long and dangerous tussle with the tremendous tidal waves at the mouth of the river, they finally reached the open sea on August 26, 1542. They sailed from the mouth of the Amazon along the northeastern shore of South America. During this voyage the two little vessels were separated by a storm and one of the ships was drawn by mistake into the Gulf of Paria and had great difficulty in getting out against the tides. But they were finally united at the Spanish settlement on the island of Cubagua.

The historian Oviedo, who wrote the stories of all the adventurers in the New World, talked with Orellana and sent a letter to Spain saying that the voyage down the river was "one of the greatest things that have happened to men." Four hundred years have passed since then and men are still making a living by writing about the difficulties and joys of travel on the Amazon, but there seems to be no reason at all for disagreeing with Oviedo's opinion.

Father Carvajal, lacking an eye and suffering, he tells us, from pains in the head but otherwise well, went back to Peru to fill an honored post in the religious life in the territory. He played an important part in improving the conditions of the Indians. Orellana went to Spain full of fine plans for conquering and colonizing the great river. An impetuous, courageous and generous man, he spent all the money he had and all the money he could raise in fitting out a great expedition. But the very qualities that made him great as the leader of a desperate party on the river made him poor as a politician and the organizer of a business enterprise. The King and his officers imposed almost impossible conditions on the expedition and gave it little financial support. Orellana sailed in May, 1545, for the river but his ships met with disaster, only two out of three arriving at the mouth of the river.

Orellana proceeded up the river in a small brigantine. Seventeen of his men were killed by the Indians. Saddened by this loss, worn out by discouragement and disease, Orellana died and was buried on one of the islands where the rush of the great river meets the tides of the sea.

WHAT HAPPENED TO GONZALO PIZARRO IN THE JUNGLES

GONZALO PIZARRO watched Orellana embark, followed him with his eyes as the little brigantine pushed out into the current and finally disappeared around the bend of the river among the high overshadowing trees. There was no doubt he was caught—too hungry and exhausted to go forward. He was cut off by the difficulty of the mountain passes behind. He could only wait for Orellana's return. Orellana could not return because he was swept so rapidly down the river and because there was so little food with which he could sustain his forces.

But as days wore on, it seemed to Gonzalo Pizarro and his men that they had been deserted. They built a number of small canoes and embarked down the river, hoping to meet Orellana on his return. After two months they came to the junction of the Napo and Coca rivers. Later Pizarro told the story that he had here picked up a man named Hernan Sanchez de Vargas who said he had been left behind by Orellana. Further, he reported that Orellana's failure to return was voluntary and that he had in fact rebelled against his leader and deserted the expedition in a moment of crisis. This is the story that most historians have accepted.

Republication and reëxamination of the very truthful record kept by Father Carvajal and other documents make it clear that Vargas was not left behind, that Orellana was anxious to return to the main expedition and that he would have done so were this possible. The only men Orellana left behind him were those who died of starvation or of Indian arrows.

As for Pizarro, he struggled on for a while through the jungle with his remaining forces. Finally they had to give up the advance. As a desperate measure they turned about, determined to cut a path along the north side of the river and in this way to reach Quito. They pounded and hacked their way through the jungle and literally crawled over the mountain passes. As they progressed, they killed and ate their horses and dogs and Gomara says that they ate their dead comrades also. Scurvy broke out and in the tropic rains their clothes rotted and fell to pieces about them. When they reached open land and found some game, there were only 80 survivors left. Two hundred and ten Spaniards had died on this expedition and 4,000 Indians.

When they reached Quito, they found the town depleted by the struggles of the Pizarro and Almagro factions. There were only six suits of clothes in the town to divide among Pizarro's naked and starving wretches. But there was food —almost too much, for some of the survivors ate so much that they suffered or died and others could hardly swallow a mouthful. It was two years after he had set out with his grand forces that Gonzalo Pizarro returned in this wretched state to the city of Quito.

GONZALO JIMINEZ DE QUESADA (ABOUT 1499-1597)

QUESADA started life in the gloomy and pompous law courts of Granada but spent more than 35 years among the rivers, mountains and tropical jungles of South America. He began as a student and a minor official but proved himself one of the most resolute and daring of explorers and exhausted and killed hundreds of men in his ceaseless pursuit of gold and fame.

In 1535 Quesada was appointed chief magistrate of the province of Santa Martha (on the northern coast of Colombia). He was to accompany Pedro de Lugo, the newly appointed governor. Quesada was with the expedition which set out from Teneriffe with 1,000 men. The voyage took 40 days and at its end they arrived to find a struggling colony on an unhealthy, inhospitable tropical coast. The new governor and his men had plenty of difficulty in getting established and in maintaining their communities. Young De Lugo was sent on an expedition into the mountains to the eastward of the port. He succeeded in storming an Indian stronghold and in capturing gold ornaments to the value of 15,000 *castellanos de oro.* With this gold in his possession, the young renegade signaled a passing ship and fled to Spain. He left his father disgraced and humiliated.

The elder De Lugo wished to make atonement and restitution for what he regarded as his failure. He decided to organize an expedition to explore the Magdalena River and to take possession of the rich, fertile country which rumor said lay in the interior. That river had already been ascended 150 miles as far as Sampollon.

Quesada was named by De Lugo to head this expedition. Accounts nearly always vary as to the exact composition of a Spanish exploring company, but Quesada had under his immediate command about 600 soldiers with 100 horses. Another division of the expedition consisted of a flotilla of 5 boats carrying 200 soldiers and sailors. Quesada was to lead the land forces through unknown country to the junction of the Magdalena with the Cesari (César River). The flotilla was to go to the mouth of the Magdalena and then ascend it to the confluence of the Cesari, which was the meeting-point.

Quesada carried out the march but found it one of almost unbelievable difficulty. He moved into the uninhabited country in the Sierra de Chimiles. He had not won through this district before provisions ran short. Horses, men and equipment had to be gotten across the Ariguani River by swimming, and they spent 12 days in marching through river lagoons. They then commenced movement up the Magdalena River proper, entering upon a journey through almost impenetrable forest. This was an advance very different from that made by Cortés in Mexico or Pizarro in Peru, both of whom moved through relatively open country and had advantage of the trails and roads constructed by the Indians. Quesada was forced to hack his way through unpenetrated forest and he was constantly fighting small, hostile and elusive bands of Indians who took to cover in thickets and behind rocks and subjected the Spaniards to a fire of poisoned arrows. By the time Quesada had reached the junction of the Cesari and the Magdalena rivers, 100 men had died and many of the survivors were ill.

The ships had not arrived. Quesada waited, grew impatient of waiting and moved up the river to Sampollon. Weeks later a new flotilla arrived. The original one had met with disaster.

The men and captains were already dispirited and weakened with fever, but Quesada was heartened by the arrival of the boats and decided to continue up the river. The boats were to keep to the stream while Quesada and the men and horses continued to make their own road. Then began another nightmare of a march.

It is probable that no human being had ever set foot on the territory they traveled, for the Indians stuck to the rivers. Every foot of the way had to be cut through virgin forests and tangles. While they worked, the men were driven frantic by attacks of ants, hornets, snakes, and occasionally by marauding wild animals. They were almost continually drenched by tropical rains. The nights were, if anything, more hideous than the days. One man was pulled from his hammock by a jaguar. Many lost their way and died in the forest. Rivers were a particular curse. Trees had to be cut and bridges built. Alligators carried off many men who had incautiously ventured into the water. There was hunger as a constant obbligato to the dirge of their travel.

When they reached the junction of the Opon and the Magdalena, it was necessary to call a council. They had then traveled for a month without seeing a sign of cultivation or a vestige of human life. They had been gone from Santa Martha for eight months. Quesada alone stood out for advance. He pointed out the difficulty and danger of returning the way they had come. He said it would be expensive to equip a new expedition. Besides, it wasn't in keeping with Spanish valor and dignity to return defeated. The lawyer had his way: the men followed him and the march went on.

Quesada decided to follow the Opon into the mountains. He sent ahead Captain San Martin with 12 men in small canoes. Their scouting expedition, pushing its way up the rapid river, came upon a new kind of Indian. These people were not fugitive. They wore mantles of a fine and beautiful weave and offered as an article of trade a shining white salt which was different from sea salt. Indeed, the town of Zipaquirá was the center of this trade. San Martin went inland, saw cultivation and returned with a native captive.

Quesada selected 100 men, took the 60 remaining horses and began an ascent of the mountains about the Opon. They moved in a downpour of rain; cooking was impossible and the men had to feed themselves by chewing on raw corn as they marched. As they climbed upwards, cold was added to their other discomforts. People looking at those mountains today regard Quesada's ascent with men and horses as little short of a miracle. Yet he made the ascent and only one horse died. Though the horses were saved, the cost in men was heavy; one man went crazy and 20 died. At last the survivors came out on the very shoulder of a mountain, 6,500 feet above sea level.

From the mountain they saw the promised land. It lay below them in a great sweep of cultivated plain. The landscape was marked with lakes and streams, about which were grouped towns and villages. There were fruit trees in cultivation, with here and there towers rising out of the green countryside. Quesada called it *el valle de alcazares*—"the valley of palaces." This was the land of the Chibcha nation. Before them lay food, shelter, repose, all that they had lacked for so many months! The scene made upon the weary Spaniards a lasting impression of fertility and peace and prosperity, and this first view from the mountain was not in any way misleading. The Chibchas were at this time a peaceable, prosperous and progressive people.

There were four ancient, populous and picturesque Indian civilizations in the New World when Columbus arrived. Within fifty years each of these had been conquered, disrupted, or almost completely demoralized. The natives had suffered torture and wars of enslavement and extermination. Whatever were the motives, this was the upshot.

The Chibchas were ruled by an interesting system of three chieftainships. One chief was called the Zipa; the second chief, the Zaque. The third chief was the religious leader who acted as mediator and arbitrator. However strange this system sounds, it appears to have been working well. Under the leadership of these chiefs the country was at peace and prosperous. Hardly had the Spaniards comprehended the meaning of the scene that lay below them before they swept down from their mountain and reduced the towns to ruin and left the Indians either corpses or slaves. They advanced with their firearms and their terrifying horses. The Zipa met them with 600 of his best and bravest warriors on the second day of the Spanish advance. The Indians were defeated with frightful losses. The Zaque was later captured and imprisoned and died of shame and a broken heart. The religious leader met the Spaniards at the door of the sacred temple when they attacked it. Over his shoulder the Spaniards saw lines of mummies of past rulers all adorned with plates of gold. The building was afire in many places and the old priest preferred to burn with the sacred emblems rather than to surrender. Then the Zipa, who had fled to a distant retreat, was attacked and killed. His successor met an even worse fate. He was seized and subjected to various tortures in the belief that he could reveal where great stores of gold and jewels, the Zipa's fortune, were hidden. The truth was that the Spaniards had already secured much of the treasure and the remainder had been distributed before the Zipa died. The torture continued and the chief persisted in his true statement until he died.

The Spanish loot consisted of great stores of richly decorated cloth, of ornamental matting and of furniture. There were also taken 191,390 *pesos de oro*, 37,288 of less pure gold, 18,390 of silver, and 1,815 emeralds. A rough estimate of the valuation places it at about half a million dollars. What these riches would really be worth at our present value is difficult to say. We are told that Quesada took home with him to Spain for the Emperor Charles V a box containing 758 emeralds.

During the occupation of the country Quesada heard, of course, the legend of El Dorado, "the Gilded Man."

Quesada began to think about permanent occupation and further conquests. He decided that it was time to return to Spain to announce his success and to secure reënforcements. Before he left, however, he founded the city of Bogotá in 1538 and set up other colonies at Velez and Tunja. Quesada saw in the land he had conquered a resemblance to the valley of Granada in which he had spent his youth and gave to the land the name of New Granada.

In establishing these Spanish settlements, he had unexpected and astonishing assistance. Sebastian de Benalcazar had been fighting with Pizarro in Peru. He had led a force of Spaniards to Quito and from Quito over the mountains and along the River Neyva until he was now approaching Bogotá. A little later there emerged from the mountain passes a body of 200 Spaniards under the leadership of a German, Nicolaus Federmann. This troop had been wandering for three years in the forested interior. So, in April, 1539, at Bogotá in the heart of a vast wilderness three explorers met who had reached this spot from three different directions.

The three decided to return to Spain together. Quesada's brother was left in charge of the new country and the company sailed in May, 1538. Despite the wealth that Quesada brought, his reception was not what he might have expected. Untrue reports were circulated about his activities and the Spanish monarch, so often ungrateful to those who served him well, turned a deaf ear to Quesada's position. Quesada was exiled from Granada. It was ten years before he was allowed to return to New Granada.

In about 1569, when Quesada was 70 years of age, he roused himself for another exploring effort. He was going in quest of El Dorado. He assembled a company of 300 Spaniards, of whom some were women, and had with him also 1,500 native porters. The expedition, moving eastward, encountered all the difficulties with which the explorer was already familiar. Sickness and death marked every mile of their slow progress, but Quesada refused to turn back. He went on until there were only 45 men of the original company left. Even then he allowed 20 men to leave and return to New Granada. But he himself continued his march until he reached the Guaviare River near its junction with the Orinoco.

It was three years before he returned to Bogotá. The expedition was a complete failure. Many men lost their lives. El Dorado was not discovered nor was anything else, except difficult, pestilential, unprofitable wilderness. Quesada returned deeply in debt. The expedition was a failure, unless we count it a gain that a dour old man, who was almost terrifying in his singleness of purpose, should have provided to the end an example of endurance, of resolution and of courage that is unsurpassed even among the conquistadors.

A Note on the Gilded Man

AWAY in the forests was an Indian chief who ruled a numerous and prosperous people. He was so wealthy that each morning when he arose his attendants dusted him with gold until he shone all yellow like the sun. In this fashion he moved about all day, and in the evening the gold dust was washed off into the river, so that it could never be used again, and the next day this process was repeated.

This legend of El Dorado, the Gilded Man, was spread over South America and the Spaniards picked it up from the Indians in many places. It was to South America what the legend of Prester John was to Asia and Africa. It focused attention on an individual who represented the romance, the wealth and power with which the human imagination endowed a part of the earth.

The whole northern part of South America was first traversed by men who were looking for El Dorado. Orellana and Pizarro heard the story in Peru and it sent them over the Andes and down the Amazon. Quesada heard it on his first trip and it accounted for his second exploration. Benalcazar from Quito and Federmann from the east were both looking for El Dorado and they met with Quesada about the plains of Bogotá.

In 1560 Pedro de Ursua caught the story again and it started him and a large company ranging the Amazon basin. They came out eventually on the shores of the Caribbean but how they reached there no one definitely knows, for the expedition was a riot of intrigue and murder and random wandering. In the jungle tactics a man named Lope de Aguirre gained control and led a wolf-like pack that ravaged the island of Margarita and swept the Caribbean coast until his men sickened of him and fled and he came to a mad end.

Farther and farther afield the legend spread. As late as 1595 Sir Walter Raleigh of England heard the story and fitted out the expedition that carried him into the rivers of Guiana. As the legend aged and grew, its character altered. At last among English-speaking people the shining figure of the Gilded Man was lost track of and Eldorado became the name of any fabulous country—the country of the human heart's desire. Milton refers to Eldorado in *Paradise Lost,* and Voltaire used it in *Candide,* and Poe made it the subject of a poem.

The fable probably originated in Quesada's territory. In the mountains of Colombia about the Lake Guatavita, there was an Indian tribe that had a curious custom. On one day a year, the people and the priests and the warriors assembled. The chief of the tribe was dusted with gold and while chants and prayers arose about the shores he was rowed to the center of the lake, and here he bathed ceremonially and the gold dust was swept away and emeralds were thrown into the lake as an offering. And this was the small kernel of fact that gave rise to the dynamic legend.

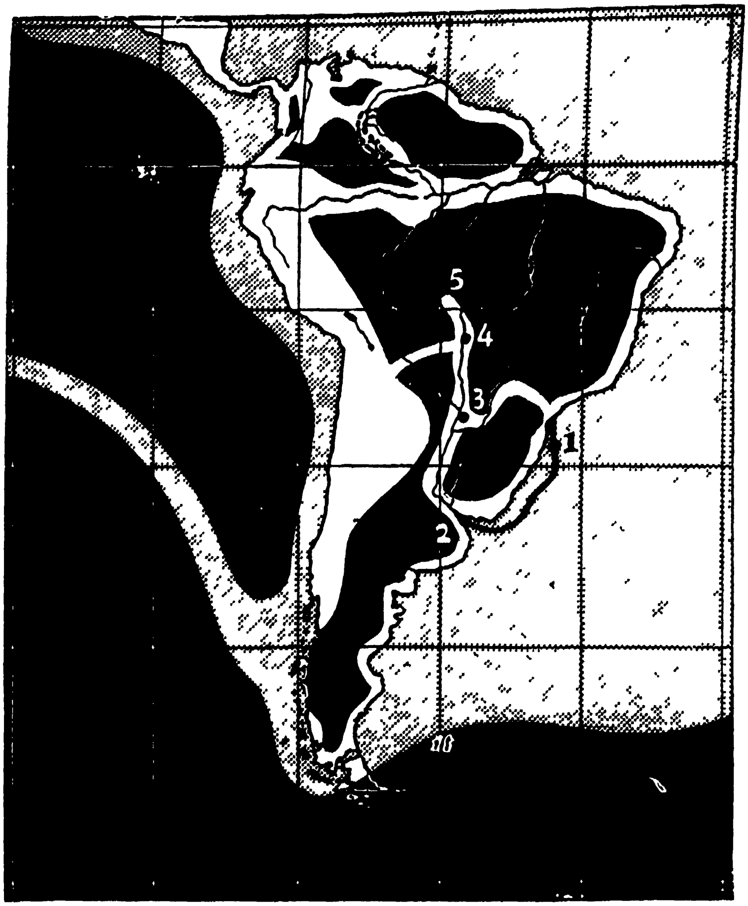
INTRIGUE AND DEATH ON THE SILVER RIVER

WHILE the mad search for El Dorado was going on in the northern part of South America, desperate efforts were being made to collect wealth in the south. This search was begun by one Diaz de Solis (about 1471-1516). There is a story that, sailing as early as 1504 with a partner named Coelho, he may have come to the River Plate. Four years later he is supposed to have made a similar voyage past the mouth of the river with Pinzon. Perhaps these stories merely show that navigators were interested in following the coast southward.

Solis was the first man to do this successfully and there is no doubt about his voyage in 1515. He left Spain with a few ships with the intention of forcing a passage through or around South America to the Spice Islands in the Pacific. He found the river and christened it *Mar Dulce,* just as Pinzon had given this name to the Amazon. He landed near Buenos Aires and then traveled farther up the river. Here he encountered Indians and with the idea in mind that he would take a few captives and carry them back to Spain, as other explorers had done, he manned a small boat and approached the shore. Instead of taking captives his party was surrounded by an unexpected number of the Indians and the six or eight of them were butchered within sight of the ships. The event horrified the survivors and they returned to Europe with the story that Solis and his comrades had been cooked and eaten by the savages. The region gained a reputation for terror which was not altogether undeserved. For some years the stream was known simply as the Rio Solis. But the story about the men being eaten was probably not true, for the natives in this region, though warlike, are not known to be cannibals.

The next to come was Sebastian Cabot (1476-1557), who was already famed for his journeys to the American coast in company with his father John Cabot as well as for some independent voyages. In 1526 he sailed in the service of Spain. He was instructed to make astronomical observations and to fix the line that had been set up by the Treaty of Tordesillas to divide Spanish and Portuguese territory. He was so confident that a strait would be found to the Pacific that he had aboard a party of colonists who wished to go to the Moluccas.

He never carried out the survey, for on the island of Margarita in southern Brazil he found the survivors of the wreck of one of Solis's ships. These men had been waiting ten years for a rescue. They told him stories of a wealthy country in the interior. Cabot forgot about the survey and began exploring the river. First he went up the Uruguay and built a fort. Juan Alvarez Ramón, whom he had sent to lead an expedition up the river, was killed and the party soon returned.



DE VACA IN SOUTH AMERICA

(1) Isle of St Catalina (2) De Vaca sends the ship to Buenos Aires (3) He marches overland to Asuncion (Ascension) (4) He goes up the Paraguay to Los Reyes (5) Among the Xarayos

Cabot started with a much larger party and had better fortune. He entered the Paraná River and came among the Timbú Indians who were less warlike and with whom he established friendly relations. This encouraged him to establish a settlement to which he gave the name San Espiritù. He continued his ascent of the river until he came to rapids at Apipé. Then he turned his attention to the Paraguay and descended that as far as the River Bermejo.

Among the Indians of these rivers, Cabot found a considerable number of ornaments in wrought silver. Collections of these he dispatched to Spain with reports of his discoveries. It was because of these that the river mouth received the name Rio de la Plata or the River of Silver.

Cabot went home in 1530, leaving behind a colony at San Espiritú. When he left, the colony fell on evil times. The Indians grew bolder and less friendly. A local chief of the Timbús was greatly impressed with the beauty of one of the Spanish ladies and thought it would be a splendid thing to steal her from the settlement. In the attempt the garrison was surrounded and massacred.

One of the most ambitious of the would-be conquerors was Pedro de Mendoza (1487-1537). In 1534 he sailed from Spain with a huge expedition, as large a one as had ever gone out up to that time. From Charles V he had secured a grant which stretched from the limits of Portuguese occupation southward towards the Strait of Magellan for 200 leagues (over 530 miles). The inland country that lay back of this coast line was also included in the grant.

He entered the River Plate in 1535 and in February laid the foundation for a settlement to which he gave the name of Santa Maria de Buenos Aires. There was no peace in the land, only a series of encounters with the Indians. Mendoza tried to carry on. He proceeded up the Paraná until he came near the spot where Cabot had founded the colony of San Espiritù, which now lay in ruins. Here he built a fort which he christened Corpus Christi. From this as a base, he sent out groups to explore the interior, particularly in the direction of Peru. These met with no success and Mendoza grew weak and discouraged and returned to Spain in 1537.

Mendoza left behind him a little party under Domingos Iralá (1506-1577). This party worked its way to the junction of the Pilcomayo and Paraguay rivers. Here Iralá founded the city of Ascension (Asunción). This little city survived but it was destined for a stormy history.

The task of relieving this community and the one at Buenos Aires fell to the stout explorer, De Vaca. He was appointed governor of the province of Rio de la Plata and in exchange undertook to organize a large relief expedition.

De Vaca sailed with 4 vessels and about 400 soldiers in addition to the pilots and sailors in November, 1540. His little fleet made a reasonably good passage and after touching in Brazil came in the spring of the following year to the island of Santa Catalina.

Here there was already a small Spanish community made up of castaways and other survivors of preceding expeditions. They were a random and rough lot of soldiers, adventurers and vagabonds. Long association with the savage and ruthless warfare of the local tribes had rendered them almost equally savage. Into this community De Vaca did his best to bring wisdom and order, a respect for authority and a humane point of view in dealing with the Indians.

While he was on the island 9 Spaniards had arrived who had made their way upwards from Buenos Aires to tell him how poverty-stricken the settlement was and how much they suffered from the cruelties of the Indians. De Vaca ordered the ships with about 160 men to proceed at once to the relief of this settlement.

He himself resolved to go directly by land to the relief of the city of Ascension. He took with him 250 men, 25 horses and a detachment of local Indians. In November he commenced his march inland. He knew only in a rough way where Ascension was and no European before him had ever contemplated a crossing of this vast territory. There was not even a well-recognized Indian trail or route. He proceeded because his countrymen were hard pressed and it was his duty to make every effort to bring them speedy relief. Throughout the march he treated the Indians with uniform kindness and won the confidence of the tribes through whose territory he was passing.

Shortly after leaving the coast he had to force his way through great mountains and cut roads through the wilderness. For 19 days they marched without seeing a sign of Indian habitation and their supplies of food soon ran short. He crossed the River Yguazú (Tibagi) with great difficulty. At one stage in the journey they had to construct 18 bridges in a single day. He finally reached the Paraná River, called also the Rio de la Plata, of which he took possession in the name of the King. He descended the river and arrived at Ascension in March, 1542.

The hardships of the southern colony still were in De Vaca's mind and he sent them further relief by two brigantines that sailed down the river. When he looked about him he found the town of Ascension in sorry enough condition. He immediately distributed food and other necessities and armed the population so that they might withstand Indian attacks. He found the self-appointed local officers of the King collecting heavy taxes on fish, butter, honey, corn and other necessities of life. The Indian "converts" were in a state of slavery and the poor Spaniards oppressed. The officials grabbed plunder and slaves and retinues of native wives. De Vaca set up his authority as his commission from the Crown authorized him to do. He freed the Indians, remitted the taxes and brought charges against the more serious of the Spanish offenders and imprisoned them.

While a great proportion of the population welcomed De Vaca's rule and benefited by it there was a faction of the former officials and also some of the priests who set about undermining De Vaca's influence. Chief among these was Iralá who hated to have his plans and his authority superseded.

The faction opposing De Vaca drew up secret letters to Spain and embodied false and exaggerated charges against him. They had no difficulty in persuading two Franciscan friars named Armenta and Lebron to carry these messages to the Brazilian coast. After the friars had departed De Vaca heard of the plan. The Indians informed De Vaca that the friars had carried off some of their daughters. De Vaca sent men after them and the friars were found with large retinues of the youngest and most attractive Indian girls.

Having brought affairs in Ascension to relative peace, he decided to carry out some exploration in the country which he had come to rule. He spent the winter of 1542 and the spring of 1543 in this undertaking. He went northward with 400 men, a number of horses and over 1,200 warriors. Part of the expedition went up the river in canoes and part proceeded by land. He succeeded in reaching the river port called Candelaria (Corumbá) and later the port of Los Reyes.

In April De Vaca returned to Ascension. The trip had been a difficult one and he and his men were ill and weary. During his absence his enemies had been working against him secretly. An armed faction invaded his house, took away his possessions and his papers and imprisoned him.

De Vaca was stuck away in a black hole where only one small candle gave him light. He lay in bed suffering from exhaustion and fever, but none the less his jailers kept great chains fastened to his feet. It was so damp that his clothes mildewed and grass grew under his bed. In the meantime the city seethed with unrest and bloodshed. Most of the population supported De Vaca, and Iralá and his followers did not dare to show their hands too openly. De Vaca's followers organized and made elaborate plans for delivering him from his prisoners. An Indian woman was allowed to cook for him and bring him food. De Vaca's jailers suspected her of carrying messages and so she was required to pass into the prison entirely naked. None the less she succeeded in carrying to the captive governor letters and plans. These were written on a very fine paper, covered with dark wax and then jammed in the creases between her toes and the ball of her foot.

De Vaca knew that his captors planned either to kill him or send him to Spain in disgrace. Nevertheless he sent back word that factional fighting should cease and that no efforts should be made by the Indians and by his friends to effect his release from jail. It was in his mind that this could serve only to produce long and savage civil warfare. De Vaca saw that whichever of the local parties won, Spain must eventually lose. The weakened city would be left an easy prey to savage Indians rushing on it from the wilderness. De Vaca said "No."

Iralá's faction then planned to get De Vaca out of the country. They fitted a ship and wrote accusing reports to the King. They planned to send De Vaca back to Spain as a prisoner in charge of his most violent enemies. But in the meantime De Vaca's friends were not idle. Under their instruction the carpenter who was working on the vessel hollowed out a great billet of wood which was fastened into the stern of the vessel. Inside the log were records and reports of De Vaca's conduct of the colony and petitions addressed to the King on his behalf as well as some of De Vaca's own papers.

De Vaca was so ill that he had to be carried aboard the vessel but he still had strength enough before it sailed to stand up and in a loud voice proclaim his enemies to be mutineers and to appoint a man to serve in his stead until a new governor should arrive from Spain. One of the jailers held a dagger at his throat but still De Vaca repeated his instructions to the people.

According to the record kept by De Vaca and his secretary on the trip over, De Vaca was chained in a dark hole in the poop of the vessel, though he was still so weak as to be helpless. Attempts were made to poison him. But as the trip wore on the officers began to see that they might find it difficult to prove their case when they arrived in Spain. A severe storm at sea terrified them and they thought their unjust accusations might be tempting the wrath of heaven. For a while they relented and released De Vaca and allowed him to have food prepared by one of his servants.

In the Azores they tried to have De Vaca detained by Portuguese authorities, making up an elaborate story that he was threatening an attack on Portuguese colonies. In the face of De Vaca's loneliness and sickness these charges were laughed out of court.

In Spain the charges regarding De Vaca's conduct of the colonies of La Plata were rushed to the King and the Council of the Indies. The old explorer and conqueror was condemned to 8 years' exile in Africa. The records are not very clear but it seems that he possibly served a year of this sentence. In the meantime new and more accurate accounts of what had happened in the colonies reached the courts and De Vaca was recalled. It seems he was appointed judge in Seville and lived out an honorable old age until he died there in 1564.

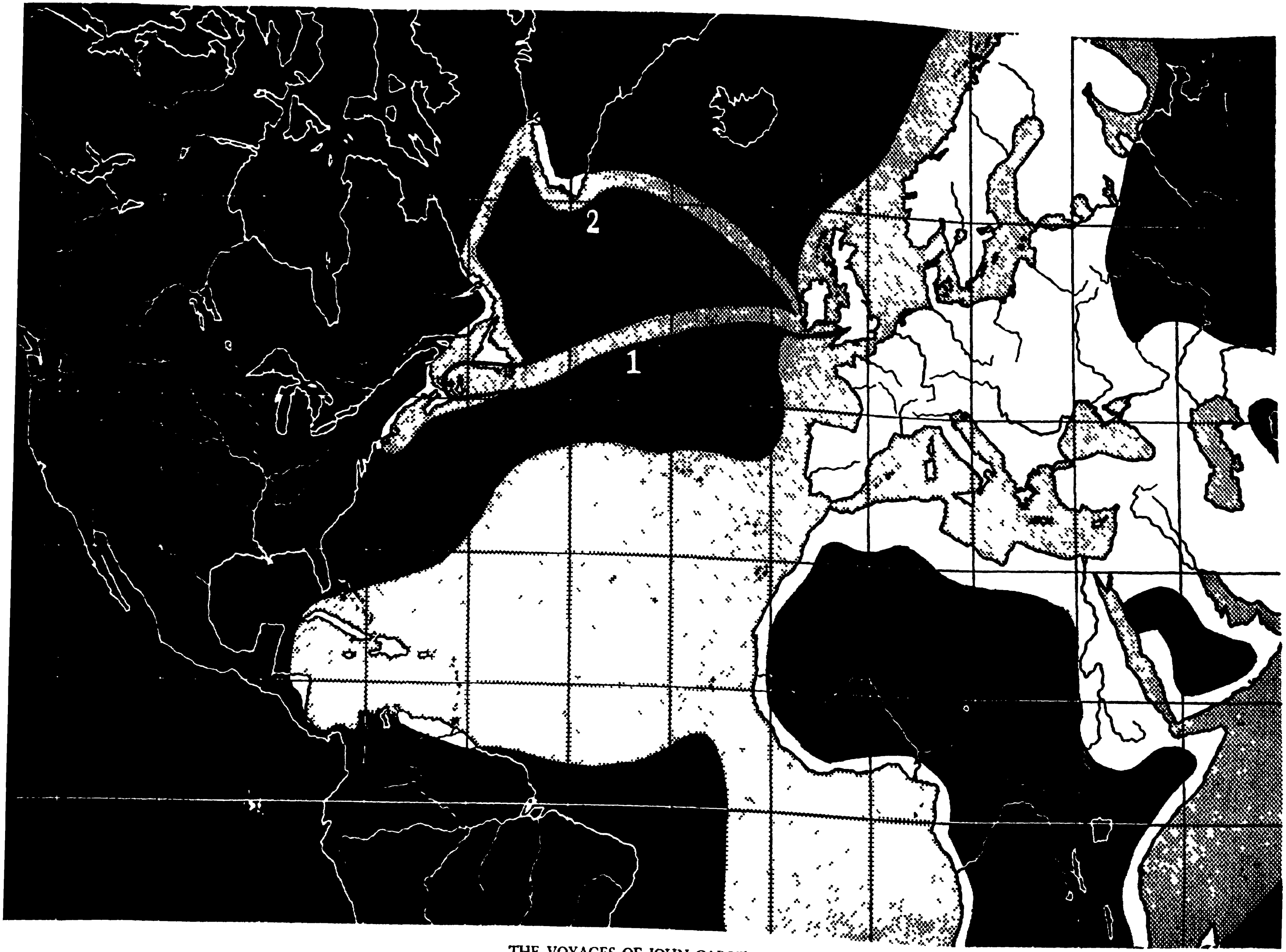
ENGLAND

JOHN CABOT (1450-1498)

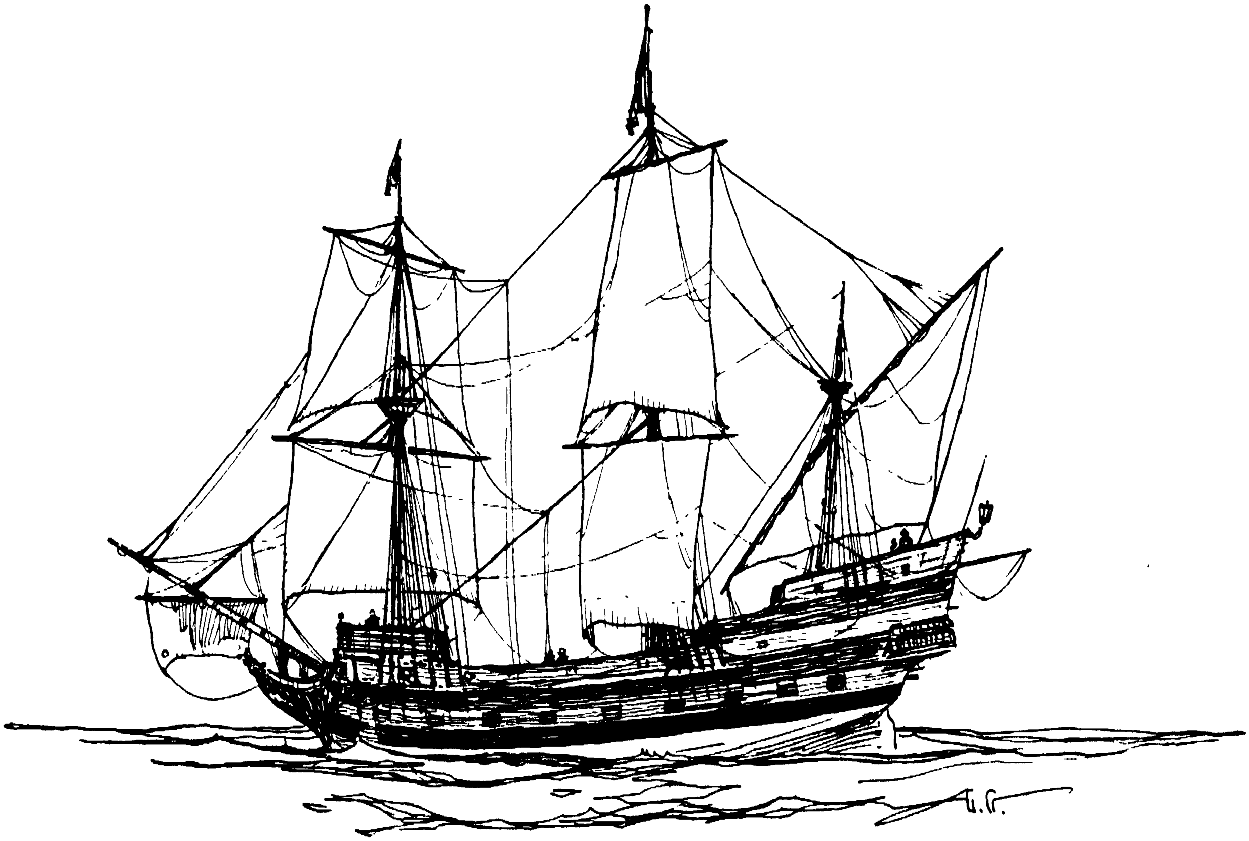
ENGLISH exploration in the West begins with John Cabot and his family. He was an Italian named Cabotto, probably born in Genoa but naturalized in Venice. He and his sons came to England and joined the shipping community at Bristol.

Bristol was an enterprising port and year by year was sending ships westward on experimental voyages. There were no results of these voyages and their purpose was not stated until 1496 when Cabot received letters patent authorizing him to sail from Bristol and to claim for England any islands or mainland which he might find and which gave him the right to colonize and a trade monopoly with these lands.

Cabot sailed in 1497. His landfall was probably on Cape Breton Island and he cruised along the shore about the mouth of the St. Lawrence. He may have passed along part of southern Labrador. His son Sebastian Cabot, who later made



THE VOYAGES OF JOHN CABOT
(1) In 1497 (2) In 1498



DRAKE'S "GOLDEN HIND"

WE do not have the exact plans for the "Golden Hind," the first English vessel to pass around the world. Our drawing shows a ship characteristic in hull and in sail-plan of the south English ports of the middle 16th century. She is about the size that the "Golden Hind" must have been.

It is curious that we are so ignorant about the "Golden Hind." We know that she was originally called "Pelican" and that when she brought Drake back from his voyage they thought well enough of her to build a special dry-dock of brick work at Deptford. In this she was preserved and exhibited but nobody thought well enough of her at the time to make a drawing of her or to preserve her exact measurements. We can guess at her form from the dimensions of the dock in which she rested. Her keel was probably 47 ft. in length; from stem to sternpost, she was 60 ft.; length over all 75 ft.; breadth 19 ft.; depth 8 to 10 ft. She was probably not much over 100 tuns, though she once paid dues at a port on 150 tuns.

We must not however be deceived by her small size into underrating her. Note how her hull and her sail-plan begin to forecast the character of later sailing vessels. See how the area of her sails has been increased over the vessel of Columbus's time. Despite the fact that the main-topsail is narrow, high and unhandy, the general sail area is broken into more easily managed pieces. The masts have shot up in height and the standing rigging—the shrouds and stays—have been developed on an orderly plan to take the increased strain.

The sail on the mizzen- or after-mast is known as a lateen sail from the fact that it is taken from the rig of small vessels used chiefly in the Mediterranean among the Latin nations. In later ships the part of the long yard and of the sail that projected forward of the mizzen-mast was cut off and in this way there grew up the gaff and the spanker —the fore-and-aft sail which found a place in the ship rig.

On the "Golden Hind" the mizzen and the little water-sail, which is seen hanging under the bowsprit, were used chiefly to keep the ship's head into the wind and for other steering purposes. They assisted the rather limited control provided by the old-fashioned rudder with its short range of action. Note the round holes cut in the corners of the spritsail. These were to let water out of the sail when the vessel dipped her bows in the long Atlantic swells.

independent voyages, may have sailed with him. The next year Cabot sailed to Newfoundland and Nova Scotia.

These voyages are of considerable importance. They show that Cabot was reaching the continental shores of America at almost exactly the same time that Columbus and Vespucci were picking up the South American coast. It was on the basis of these voyages that the English later claimed, by right of discovery, privileges in and possession of great tracts of land in northern North America.

This is of course our modern way of stating the situation. As a matter of fact nobody at that time had any idea of the extent of the American continent. There was not much reason then for seeing the relationship that was later to arise between the Spanish explorers to the south and the English adventurers in the north. It may be that Cabot already entertained the idea of sailing on the northern route to Asia but he can hardly have had the idea of exploring a northwest passage, for it was not known that there was an important land mass to be passed. So much for theory.

The practical outcome was that Cabot discovered the richness of the fishing grounds on the Grand Banks and along the American coast. From this time forward an increasing number of English ships went west for the fishing each season. It is just possible that vessels from Brittany were already fishing on parts of the Banks. It is certain that by the early years of the 16th century, the French, the Dutch, the Portuguese and the English were sending fleets to these waters and that this industry was a matter of growing importance.

The Vikings of course had been here before Cabot. A claim has also been made that João Vaz Corte-Real, a Portuguese, joined a Danish vessel, reaching here in 1472-1474. The sons of this man made several unsuccessful and disastrous voyages along this coast in about 1500. One after the other they sailed off but neither ships nor men ever returned.

Both Cabot and Corte-Real called this coast "Baccalaos," or as we would say, the Land of the Cod.

A Note on Codfish

THE discovery of the fishing banks was not altogether a minor or prosaic matter.

For in those days the amount of meat that entered into the diet of the European countries was limited and the church prescribed a fish diet on many days of the church calendar.

For poetic and romantic interest codfish can hardly compete with the gold plaques of the Aztecs or emeralds from Colombia. Yet the growth of the fisheries on the Banks has a dramatic interest all its own. Brendon, an English writer, makes a comparison of the value of the fisheries to England and of the treasures that went to Spain from America. In 1521 Spain took out of America £52,000, in 1545 the estimate was £630,000 and this was apparently the year on which the most treasure from America reached Spain. By 1575 the revenue was only £440,000, and at the end of the 16th century, less than £300,000. Fishing on the Banks from the English ports began in 1501 and 1502. It was slower to gain headway than the spectacular business of plunder and conquest. But by 1615 the fish sent to England from the Banks were bringing in yearly £200,000. By 1640 the revenues were £700,000 each year, and this continued year after year until by 1670 the value of the fisheries to England alone was £800,000.

GIOVANNI DA VERRAZANO (ABOUT 1480-1527?)

IT was Verrazano and not Hudson who discovered New York Bay and the mouth of the Hudson River. Here is how it looked in 1524 on the first arrival in New York of a European vessel:

> "At the end of a hundred leagues we found a very agreeable situation located within two small prominent hills, in the midst of which flowed to the sea a very great river, which was deep within the mouth; . . . On account of being anchored off the coast in good shelter, we did not wish to adventure in without knowledge of the entrances. We were with the small boat, entering the said river to the land, which we found much populated. The people . . . clothed with the feathers of birds of various colors, came toward us joyfully, uttering very great exclamations of admiration, showing us where we could land with a boat more safely. We entered said river, within the land, about half a league, where we saw it made a very beautiful lake with a circuit of about three leagues; Through which they [the Indians] went, going from one and another part to the number of XXX of their little barges, with innumerable people, who passed from one shore and the other in order to see us. In an instant, as is wont to happen in navigation, a gale of unfavorable wind blowing in from the sea, we were forced to return to the ship, leaving the said land with much regret because of the commodiousness and beauty, thinking it was not without some properties of value, all of its hills showing indications of minerals."

Verrazano came from Florence in Italy and was probably born there between 1480 and 1485. He traveled extensively and then drifted into the employment of the French. There is much suspicion, but no definite proof, that he is to be identified with the French corsair or pirate, Juan Florin or Florentin, who made raids upon the commerce between Spain and her colonies. In 1523, this Florin captured Spanish vessels which were bringing treasure from Cortés in Mexico to the emperor in Spain.

If Verrazano *was* Florin, this capture would account for his being able the following year to fit out four vessels and start on a voyage to China. He met storms and was forced back to the Brittany coast. In one repaired vessel, having with him a crew of about 50 men, he sailed to Madeira and from there westward. In running out of a storm he turned somewhat northward from his original course and came in on the eastern shore of America—he says about latitude 34° N., which would have brought him on the North Carolina coast near Cape Fear or Cape Hatteras. He could not have picked up the shore anywhere north of New Jersey, for he describes very clearly a low-lying sandy coast across which water could be seen, though he could find no entrance or anchorage. After sailing first a short distance south, he turned northward and then, continuing, came to New York.

He continued as far as Block Island or Martha's Vineyard, ran into Newport, and continued coasting until he came to a heavily forested shore. He touched Newfoundland, which had already been visited by the Brittany sailors. (Aubert had been to the St. Lawrence in 1508.) From here he made a good crossing back to France where his success aroused some attention and accounted in part for the subsequent expedition of Jacques Cartier.

No one knows what became of Verrazano. Unless it was true that he was also the pirate, Florin. Florin was captured by the Spanish and hung in 1527.

JACQUES CARTIER (1491-1557)

AROUND 1491 Jacques Cartier was born in St. Malo, that is to say he was born a simple and honest seaman. He was known sometimes as "The Corsair." The word "corsair" had many meanings: if you were a Spaniard it meant pirate; if you were a loyal subject of Francis I of France, it meant a privateersman and a brave fellow.

How Cartier earned the title "Corsair," or even if he earned it, we do not know. For while Cartier was still a young man, France achieved a relative state of peace. There was not much employment for the ships or men of Cartier's profession—whatever his profession was. So in 1524 King Francis sent Verrazano out and ten years later Cartier decided to try his hand on a western voyage with intent to discover a route to the Indies.

The course for ships from Brittany to Newfoundland was already known to fishermen when Cartier took his two ships and 60 men out in April of 1534. He came too early in the season and found a bleak coast with great blocks of ice tumbled and upended all along the rocky shore. So he spent some time in fitting out his long-boats and northward, along the coast, found a small island, full of so many birds that they seemed to have been packed there. Here was an opportunity not to be lost! They ate all they could and then salted down five or six casks of them. Then, though the weather held stormy, they passed through the Bay of Castles (Strait of Belle Isle) and in a little harbor waited at anchor through the early part of June.

One night a big ship came sailing up, running from the weather and looking for a place to fish. In the morning Cartier sent out the longboat, found that the vessel was from La Rochelle and brought his countrymen to an anchorage. Cartier mentions the incident almost casually, but it shows that though he was in the Gulf of St. Lawrence, he was not yet on unknown territory.

But when Cartier came into Chaleur Bay, he was advancing into new regions. He was disappointed to find that this was not a passage leading westward but was encouraged to see a better soil and fine trees, shrubs and wild grain. A little later at Paspebiac Point nine canoes of Indians came up. Cartier says: "As soon as they saw us they began to run away, making signs to us that they had come to barter with us; and held up some furs of small value, with which they clothe themselves. . . . The savages showed a marvelously great pleasure in possessing and obtaining these iron wares and other commodities. . . . They bartered all they had to such an extent that all went back naked without anything on them. . . ."

At Gaspé Harbor on Friday, July 24, Cartier made his formal claim to the country. He erected a great wooden cross and engraved on a wooden board: "Long live the King of France." He carried off two Indians and sailed away. He continued westward along Anticosti Island, still trying for a westward passage. In August, while they were fighting the heavy river currents, they had a spell of bad weather. At a meeting of captain and pilots, fearing the storms off the Newfoundland coast, they decided to sail for home. They reached St. Malo September 5th.

They came home well and with the ships all safe. To be sure, they had found no westward passage, but Cartier spoke of "The land falling off to the southwest and open waters to the westward, leading whither no one could say." The King was impressed and ordered Cartier to complete the discoveries of the western lands. So in 1535 he sailed again.

Again he made his landfall on Newfoundland and passed the island that had so many birds. This time the ships passed north of Anticosti

Island and came to the mouth of a river. The Indians told him that this river was the Saguenay and that copper came from it. They told him also that the great river running westward was named the Hochelaga (St. Lawrence). The river led to a region called Canada. Yes, one could go up this river but no one had ever come to the head of it.

Cartier decided to follow the big river rather than the Saguenay. He discovered and named the island of Orleans and came to a fine spot which the Indians called Stadacona (modern Quebec). Donnacona was the Indian chief of this place and he came with twelve canoes to exchange gifts with the French. He was very friendly until he discovered that Cartier intended to moor his big vessels in the little St. Charles River and take his small boats and go further westward. He tried to make objections. "The Captain [Cartier] ordered a dozen cannon to be fired with their bullets into the wood that stood opposite to the ships and the Indians. They were all so much astonished as if the heavens had fallen upon them, and began to howl and to shriek in such a very loud manner that one would have thought hell had emptied itself there."

There were no more objections and they started west in the smallest of their ships, a barque, and in the two long-boats. For ten days they proceeded up the beautiful river that ran through rich level regions where there were the finest trees in the world, oaks and elms and walnuts, pines and cedars and all the rest, just as there were in France. And there were grapes on the vines and many birds flying in long black rivers against the evening sky that was yellow and red in the west. They had to leave the barque because of difficulty with the current. But the long-boats pushed on and came in early October to Hochelaga. "There came to meet us more than a thousand persons, both men, women and children, who gave us as good a welcome as ever father gave to his son, making great signs of joy; for the men danced in one ring, the women in another and the children also apart by themselves." They climbed Mount Royal and gave it its name, and looked off over the fertile river-plain to the south and saw in the distance the blue hills like sugar-loaves rising unexpectedly from the plain. And westward they saw the Lachine Rapids and the river going on, no one knew where! But the friendly Indians all said that wild tribesmen lived there.

Cartier was not looking for trouble with so many Indians about him and it was too late in the season to go on. So they went back down the river and picked up the barque and returned to the other ships at St. Charles.

Here they secured the ships and built a fort and spent the winter. A long cold winter it was. Scurvy broke out and, though the Indians visited them daily, Cartier was no longer sure of their complete friendliness. By the middle of February, men in the ships were sick. Twenty-five men died, and of the 110 forming the company there were not 10 in good health, "so that no one could aid the other, which was a grievous sight considering the place where we were. . . ."

At first Cartier tried to hide their condition from the Indians and he would go out with a few men to meet them while he instructed the others within the ship, including the sick, to make a show of working and to make a prodigious uproar, pounding on the hull as though all were well and great enterprises were going forward. Talking discreetly with the Indians about this sickness they learned that they had a cure for it, which was a juice made from the leaves and buds and bark of a tree. This cure worked wonders with the sick men. They recovered rapidly and once they knew its value, fought over the Indians' cure to see who should get it first. They recovered, but it was a long winter. They were frozen in the ice from November to April.

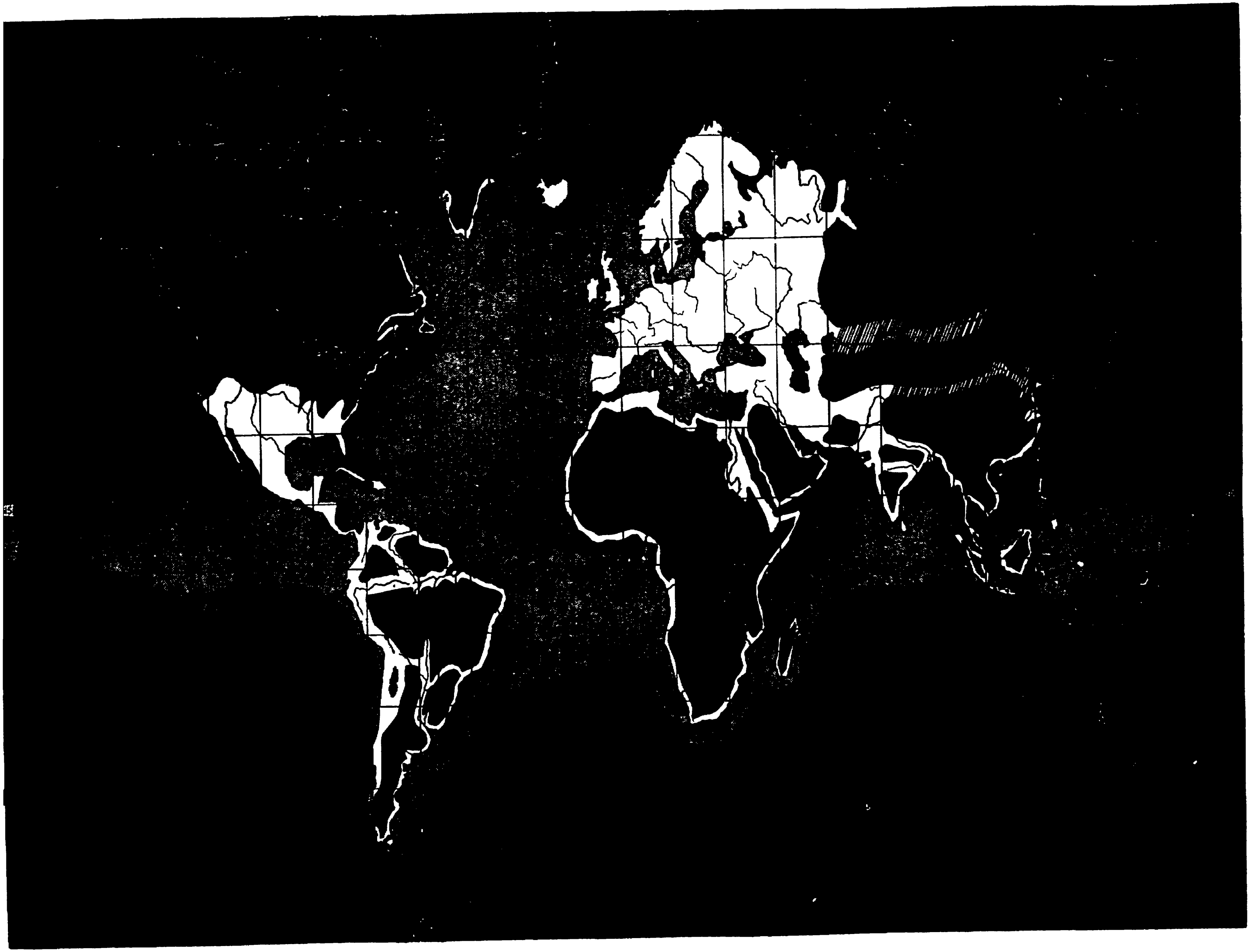
When they returned to France in the spring they took with them Donnacona and two Indians, thinking it would please good King Francis, but the King was not pleased. Just then the Spaniards were bothering him so in the south that he had no taste for adding a new frontier in the west. The sufferings of Cartier's men did not make a pleasant story and neither gold nor a sure passage to China had been discovered.

It was Jean François de la Rocque de Roberval who saw an opportunity in all this. Why should he not use Cartier's discovery to his own advantage? He persuaded the King to permit a new expedition of which he became the leader. Though Cartier was to retain the title of Captain-General and was to be chief pilot, Roberval was to be in charge, if titles meant anything. He was named as "Lord of Norumbega, Viceroy and Lieutenant-General of Canada, Hochelaga, Saguenay, Newfoundland, Belle Isle, Carpunt, Labrador, the Great Bay and Baccalaos." He was to found a colony in these possessions which were named collectively New France and were considered to be the northeastern end of Asia.

It was in May, 1541, that Cartier set out again from St. Malo with five vessels. Roberval was not fully prepared and was to follow later with two other ships. Again there was a stormy passage and the ships were blown apart and fought it out alone on a three months' voyage until they came together in Newfoundland. Here they waited for Roberval, though he did not arrive. In August they went on to the region near Quebec.

Cartier made his headquarters 9 miles above Quebec and when the cold days of fall came he knew the winter was drawing in. Roberval had not appeared, so he sent two ships back to France to tell the King how matters stood with them. The ships departed and Cartier built a fort and got ready two boats to go up the St. Lawrence River. He went to Hochelaga and made an attempt to get up two of the rapids. Then he heard that the Indian chiefs were exchanging visits and plotting against him, so he went back to his ships and his fort. He made a good winter of it but in the spring it was plain that provisions were running short and that the Indians were less friendly than in the old days. There was no word from Roberval at all. No doubt it seemed to Cartier that this man was wanting in enterprise or in some other quality requisite either to a partner or a chief. Cartier sailed for home.

On the way back he passed by the harbor of St. John's, Newfoundland, and here was Roberval arrived at last with three ships and 200 colonists! There was a conference and Roberval, fresh from home, was eager to move westward. But Cartier's enthusiasm was ebbing; the current of his thought now set eastward toward the gray-walled port of St. Malo and France. Quietly he gave orders and in the night stole out of the harbor and sailed home. Roberval went on and tried his hand at exploring with no great success. It is told that Cartier made a fourth voyage, that he was sent out by the King in 1543 to bring Roberval home. But this is uncertain. Whatever happened, it does not greatly matter. It would have been for him no more than a summer voyage. Indeed he had had voyages enough! He settled down and became a familiar figure about the ports. Men sought his advice on many technical nautical matters and he found it was not a bad employment. Perhaps as he moved about the port his eye lingered longest on the little barques that now went with each summer season to the fishing banks. Perhaps in the summer evening he looked westward and saw again the ducks in a long line flying over the low river-marshes and in the winter evening would tell stories of the great river he had seen in the West and of the Indians dancing on its banks at Hochelaga the day he first came there—"the men in one ring, the women in another and the children also apart by themselves."



THE WORLD IN 1550

A Sign Post

WE have now followed the major explorations of the world up to the year 1550. It has been possible to arrange explorations in a simple order both by nations and by time, because different nations each in turn led the world in exploration.

There is a map of the world for 1550. By this time the general outline of the world was reasonably clear. The great oceans had been crossed, the world circumnavigated, Africa circled and every continent, except Africa and Australia, had also been crossed.

After 1550, exploration developed very rapidly, many nations taking part in many portions of the globe. The plan of our book alters therefore and hereafter we watch the unfolding of exploration by different continents and areas. For convenience we take them in the following order, which still shows in a very rough way how interest has shifted from one area to another:

North America
South America
Asia
The Pacific and Australia
Africa
The Arctic
The Antarctic

PART IV

NORTH AMERICA

CANADA

Sir Martin Frobisher (about 1535-1594)

MARTIN FROBISHER started his explorations 80 years after Cabot. But he took up the problem of a western passage to China almost where Cabot had left it. Frobisher came from an influential family in Yorkshire and as a boy had already developed a taste for the sea. When he was 9 years old, Sir John York, a relative, found him a place on a ship sailing to the Guinea coast. By the time he was 30 he was serving in Ireland and was already called Captain Martin Frobisher.

By 1576 Sir Humphrey Gilbert, the scientist and theorist, Michael Lock, who contributed toward the financial support, and Frobisher, who was to do the practical exploring, had come together and organized an expedition. This set out in two small barques, the "Gabriel" and the "Michael," and a pinnace. Their combined burden was under 50 tons, and the total crews were less than 35 men. They had hardly cleared the Shetland Islands before the pinnace was lost in a storm. Later the "Michael" deserted and returned home. Frobisher sailed on in the "Gabriel" and arrived in Greenland in about latitude 62° N. He skirted the southern point of Greenland and sailed westward until he came to the mouth of Frobisher Bay. Northward lay the ice so he followed into this bay but got no farther than Butcher's Island, where ice again stopped him. Here he had some dealings with the natives and in the process five of his men were lured away from the ship and captured. Frobisher was finally compelled to return home without them.

He brought back with him some examples of "black earth" or ore. In England it was reported that this ore contained gold. Queen Elizabeth subscribed £1,000 to a new expedition and lent the assistance of a naval ship, the "Aid." Frobisher received the title "High Admiral" and in addition to the "Aid" he commanded two other ships, the "Gabriel" and "Michael." The vessels again reached Frobisher Bay and returned with 200 tons of the reputed gold ore.

Back in England the useless ore was dumped ashore and much time and energy were spent in assaying it and in trying to extract the precious metal it was supposed to contain. There were debates and disappointments, but the Queen herself refused to believe the ore worthless. She gave it the powerful name "Meta Incognita" and fitted out an even larger expedition.

This expedition sailed in 1578, and again touched at Greenland, where Frobisher landed for a short while. The ships then passed westward and were out of sight of Frobisher Bay when a storm overtook them and the barque "Dennis" was wrecked. The remaining vessels were driven up a broad, hitherto undiscovered body of water which led westward. Immediately, dreams of the passage which should lead to the South Seas and to China came again into the mind of the explorer. He would have been glad to forget all about the gold and resolutely to have continued sailing westward. But he had his definite instructions, the weather was stormy and the men not anxious to advance with him. His 60-mile sail up the broad strait undoubtedly represented an accidental discovery of Hudson Strait. The ships returned to Frobisher Bay. A good deal of the supposed ore was extracted and some attempt was made at establishing a colony. But winter came on rapidly now; snow fell and at night ice covered the bay about the anchorage of the vessels; also, beer was running short, and this unfortunate combination of circumstances prompted the return to England.

The ships brought back 1,300 tons of ore, which was quite useless but for which they paid dearly in time and energy and in the lives of about 40 men.

Judged by their immediate results the voyages of Frobisher were expensive and futile. They benefited commerce not at all and learning only a little, but they did serve to generate an interest in the possibility of a northwest passage.

Frobisher was a good seaman and experienced commander. Part of the romantic interest he held and of the honor he won was due to his subsequent career as a naval leader. He was with Francis Drake on an expedition to the Indies and also served in the fleet that went out to meet the Spanish Armada. In 1592 he commanded a fleet for Sir Walter Raleigh which raided the Spanish coast. He died in 1594 of a wound received while in an attack on the French port of Brest.

HENRY HUDSON (D. 1611)

NOTHING is known about Henry Hudson except the record of the voyages he accomplished. Nothing is known about his origin and he disappears from history amid the ice floes and the mists of the great northern bay that bears his name.

The Muscovy Company was organized to find a short route to China by sailing over the North Pole or near it. Hudson's first voyage was undertaken in 1607 and was aimed at the Pole. He proceeded to the east side of Greenland and followed this north; then his progress was blocked by a great ice barrier. He sailed along until he came to "Newland," which is now known as Spitsbergen. Again, he went as far north as the ice permitted until he reached latitude 80° N. When he arrived in England, he made recommendations regarding the hunting of game in the far north and thus gave an impetus to English whale fisheries in Spitsbergen.

In 1608 he made another Arctic voyage, trying this time for an eastern route to China which was to send him between Spitsbergen and Novaya Zemlya. The Dutch navigator, William Barents, had already made an attempt on this passage. Hudson had no success in working to the northeast. He tried again for the northwest, only to run into a further ice area. He had to give up and return home.

Hudson's next voyage was carried out for the Dutch East India Company of Amsterdam. It was on this voyage that he sailed from Holland in April of 1609 in a small Dutch vessel, the "Half Moon." His commission permitted him to reach China either by making a northeast or a northwest passage, whichever seemed to be most desirable. In May he was again in the Barents Sea near Novaya Zemlya undergoing the hardships of cold and of uncertain navigation amid dangers of ice and fog. In the little vessel his small crew of 18 or 20 men grew quarrelsome and mutinous. Hudson pointed out to them that two courses lay open. They could sail for the American coast and try a passage which Captain John Smith said existed in about latitude 40° (Smith had sent a letter and map which showed such a passage through the land) ; or, they could try a passage in higher latitudes through Davis Strait. The decision was in favor of Captain John Smith's route. In the middle of May Hudson stopped at the Faroe Islands and then set out for China by way of the Chesapeake.

In June the "Half Moon" was off Newfoundland and there one of her masts snapped and went overboard. Hudson made for the American shore and stopped probably in the Kennebec River, where he cut and fitted a new mast.

He saw the Indians, noted that there was good cod fishing and that there might be a good trade in furs. He touched the Maine coast again at Penobscot Bay and probably also stopped along Cape Cod. He rounded Cape Cod, set a southwest course, and by August was in the Delaware Bay region.

His attempt to find a western passage then carried him northward, and it was in the early part of September that he came into New York Bay. Verrazano had already discovered this harbor, but Hudson bettered this performance by sailing up the Great North River. He went as far as he could (between Troy and Albany) and made certain this stream did not lead to China.

This same season another European voyager was trying to reach China by sailing up another American river. Champlain had worked his way up the St. Lawrence, the Richelieu River and had entered Lake Champlain. The routes of Champlain and of Hudson approached each other within less than 100 miles.

Again, Hudson was having trouble with his crew. He turned about and in October sailed from the American coast for Holland. He put into Dartmouth in England on his way home. Here the "Half Moon" was seized by the British government and Hudson and the other Englishmen were commanded not to leave England. If he wanted to sail again he could sail in the interests of his own country.

In many ways Hudson's voyage was a disappointment to him. He had not found a way to China or to the great "South Sea." He had sailed along a considerable coast but this had already been visited. The only section of his route which really broke into new territory was the sail up the Hudson River. Yet, this voyage had two historical results. Previously a myth had grown up that in about latitude 40° the Atlantic and the Pacific oceans approached each other in much the same way as they did at the Isthmus of Panama. Verrazano's reports had helped to stimulate this erroneous idea. Hudson, by exploring the Chesapeake and the Hudson, had shown that the idea was false. In the second place, Hudson's voyage created considerable interest in the fur trade and gave a new reason for English colonization and exploration in America.

But Hudson's active imagination did not cease working on that hope of a passage westward. Blocked in the south he turned his attention again northward. In England a company was organized to promote a new venture under Hudson's direction. This time he determined to find a passage westward of Greenland through the strait that Davis had already seen and reported.

Hudson sailed in April, 1610, in the "Discovery," a ship of 55 tons. By June he had already arrived in the body of water which we now call Hudson Strait. This was good progress. It was almost too good progress, for he had come upon these waters before they were fit for navigation. With greater experience we know now that later in the season the passage through Hudson Strait can be made without great difficulty. Hudson, on the other hand, ran into all the uncertainties and terrors that the northern waters can present. The ice in the straits was breaking up but the waters were not yet cleared, so that ice-pans and growlers surrounded the ship as he tried to work his way westward. Furthermore, the bergs and the loose ice kept moving against him, so that the whole drift seemed to impede his progress. The sound of the moving ice was terrifying to seamen who had had little experience with ice navigation, and this feeling of eerie terror was accentuated by the frequent and sudden fogs. When they encountered land, it seemed almost as dangerous and forbidding as the ice. Bleak, rocky headlands rose suddenly upon them out of the mist and sea and disappeared again. No refuge from the sea!

*The dangers worked on the minds of Hudson's crew until they became alarmed and re-*sistant to his commands. An air of mutiny again entered and hung about the ship like a penetrating fog.

Now, there are some commanders who have a knack of dispelling the gloom and irresolution of their men. Hudson had not this knack. It was not a lack of courage, for no one can doubt that in a measure he had great personal courage. He had already repeatedly faced danger and had even gone forward to welcome it. It was not lack of purpose, for this was the fourth time he had pushed his ships to the limit of the known world. Yet, there must have been about him some air of irresolution and despondency of manner which turned men from him. His gloom lacked that dignity of high and tragic resolution which often commands men's loyalties.

Hudson had his opponent in one Henry Greene, who brought to a focus the fear, the discouragement and the hostility of Hudson's men. Yet, for a while, Hudson succeeded in holding these forces in check.

In that summer of 1610, he laid his plans before his men and won a grudging consent to a further advance. They dodged and fought their way westward until in the beginning of August they came to the great bay of open water which now bears Hudson's name. There is a last entry in Hudson's journal, dated August 3rd, which says: "Then I observed and found the ship at noone in 61 degrees, 20 minutes, and a sea to the westward." It may well have seemed to Hudson at the time he wrote that line that he was on the brink of triumph instead of being on the brink of a bitter defeat. Though the only journal of Hudson's voyage closes here, the voyage itself did not.

He took the ship southward, examining carefully the eastern shore of the bay. In November he had reached James Bay and here the ice blocked the ship and the cold nipped the little company. So, they went into quarters.

During the winter provisions ran short and patience ran short also. The idle men found plenty of time in which to brood upon their discomforts and hatch their discontents. By spring, when action was again possible, the plot had matured. Henry Greene quarreled with Hudson, defied his authority and organized the discontented crew to a mutiny. Hudson and eight others, including men who were sick and helpless, were forced out of the ship into an open boat and set adrift. This happened on June 22, 1611. It is the last definite news we have of Henry Hudson.

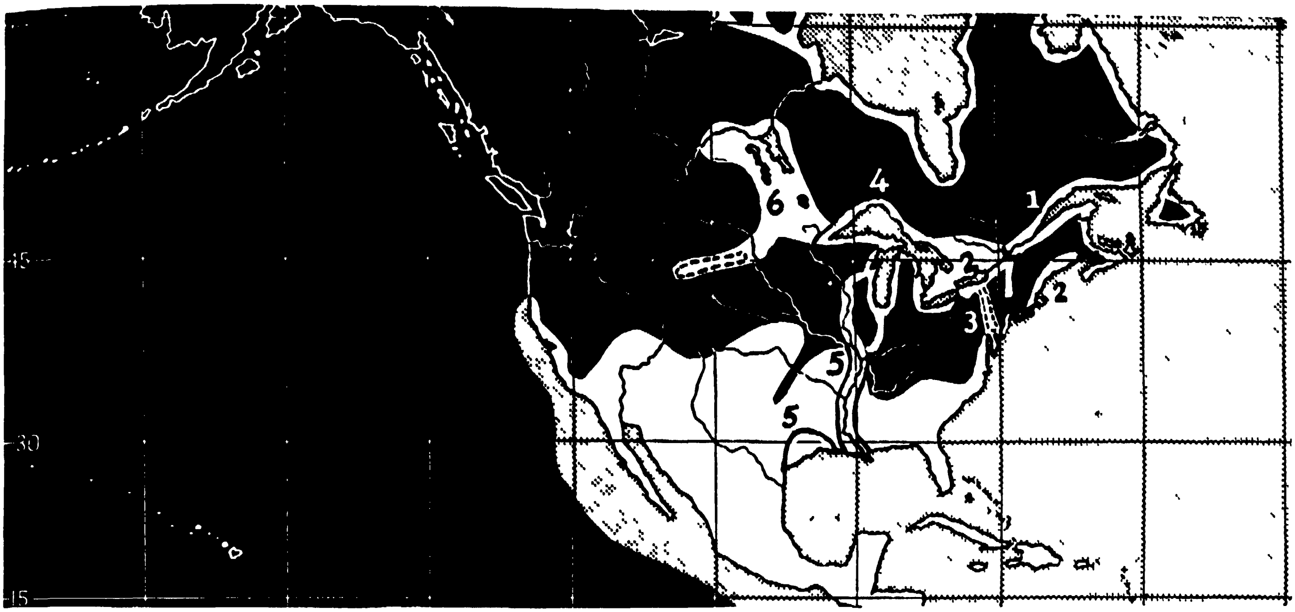
One Robert Bylot was elected master of the "Discovery." The ship was turned about and headed for England. But before it reached English shores, Greene and some of his companions had been killed in a fight with Eskimos. Only a few survivors reached England, and there they were imprisoned.

SAMUEL DE CHAMPLAIN (1567-1635)

AFTER Cartier and Roberval left the St. Lawrence the great river valley was undisturbed for many years. Fishermen came to the mouth of the river after Cartier, just as they had done before him. But it was 68 years later before Champlain reached Mount Royal. And then there were no vestiges of Cartier's having been there or of the Indian settlement of Hochelaga.

We remember Champlain because he founded the first permanent settlement in Canada and because he discovered the beautiful lake that bears his name. And this somehow makes us forget that we owe to him the first systematic exploration of the New England coast.

Champlain was a sailor from a small French port on the Bay of Biscay, the son of a sea-cap-



THE FRENCH IN AMERICA

(1) Cartier on the St Lawrence, 1534, 1535 6, 1541 (2) Champlain on the Atlantic Coast, 1603, 1604-7 (3) Brule, 1616 ( ) (4) Champlain on the Great Lakes, etc , 1609-11, 1613-16 (5) Nicolet, Marquette, 1634, 1669 (6) La Salle, 1681 1687 (7) Le Verendrye, 1732-49

tain. Ships and the sea were his birthright. As a young man he served in the army and navy of France and made a voyage to the West Indies in the service of the king of Spain. He rapidly acquired a knowledge of navigation and surveying and other sciences which are the tools of the soldier and seaman.

In 1603 Champlain was made joint-commander and named as Geographer Royal in an expedition which Aymar de Chastes was sending to the New World to plant the "cross of Christ and fleur-de-lis of France." It was not altogether an altruistic enterprise. He received a monopoly of the entire fur trade. De Chastes soon died and the monopoly was taken up by Pierre de Monts. Under his patronage Champlain and his fellow commander Pont Gravé sailed for many years.

In the voyage of 1603, Champlain surveyed both shores of the Gulf of the St. Lawrence and advanced 40 miles up the Saguenay stream. He came out again in 1604 and commenced a long survey of the Atlantic coast. He landed near Cape Breton, worked around the southern coast of Nova Scotia, explored the Bay of Fundy and Passamaquoddy Bay. The ships went home but Champlain and about 80 men made a little settlement on the St. Croix River. They suffered the usual hardships, including scurvy. Unlike Cartier's men, they did not have the help of the Indian medicine. Half the men died before the French ships returned in the spring.

This season Champlain explored and mapped the coast and the rivers from his winter quarters as far south as Boston Bay. He discovered the Charles River and Plymouth Harbor which he called Port du Cap St. Louis. This was 10 years before Captain John Smith called it by its present name and 16 years before the Pilgrims landed here. He passed Cape Cod and entered Nauset Harbor.

Again the French ships went home and again Champlain and a company of men spent the winter in America, this time on the Bay of Fundy. In the summer he sailed as far as Vineyard Sound on the south coast of Massachusetts.

This remained the southern limit of his explorations. After another winter, the monopoly was rescinded and in 1607 all sailed for Europe and France. This was the first time in over three years that Champlain had been home.

But in 1608 he was off again, this time to launch himself on his greatest exploration and his most characteristic undertakings. It was in this season that he set up the European community on the present site of Quebec and here he planted gardens with grain and seeds. Some distance away the remains of a chimney still standing marked the spot where Cartier had spent the winter. Champlain commenced to develop friendly relations with the Indians, making a genuine effort to instruct them in religion, to learn their languages and customs and to develop trade with them. The winter was not much better than other winters had been, but having already in the fall quelled a conspiracy against his life and sent three troublemakers back to France, the little colony held together with cheerfulness, despite the scurvy and the blast of the winter sweeping down the river.

His work with the Indians had succeeded so well that by the spring the Hurons and Algonquins made an alliance with Champlain and a plan to attack the strong and savage Iroquois who were their traditional enemies. In exchange for the assistance which Champlain promised them, the Indians agreed to take him on an exploring expedition to a river and great lake that they knew of, which lay toward the Iroquois country. In July they set out, passing up the St. Lawrence to the mouth of the River Richelieu. The party was not altogether a harmonious one and some of the Indian allies withdrew and went home. Champlain, on his part, was not confident of his associates, so he sent most of his own men back, pushing on in the Indian canoes with only two companions. This trip carried him up the Richelieu and into Lake Champlain with its beautiful islands and its expanse of water stretching away southward between the Green Mountains and the Adirondacks. The Adirondacks were then held by the Iroquois confederacy and Champlain was advancing into the territory of the enemy.

The party now lay in hiding during the day and moved up the lake at night. They came, at last, to the spot where Fort Ticonderoga was later built and here won a victory over the Iroquois. In this Champlain kept his compact with the Indians who were his friends. But this act probably made permanent enemies of the Iroquois and made them the natural allies of the English against the French.

The battle with the Indians and the dangerous position in which he was placed did not prevent Champlain from exploring Lake Champlain and from bringing back surveys and accounts of the whole country through which he had passed. When he returned to France he had an impressive story to tell. It was decided that exploration in New France must go forward and that he was the man to lead this enterprise. The humble sailor now became Governor-Lieutenant of Quebec.

Champlain now made a very influential but somewhat extraordinary marriage. The bride was Helen Boullé, the daughter of the secretary of the King's chamber. Champlain was then over 40 and the bride was 12. As she was not of marriageable age, she remained at home several years before she joined her husband. But in the meantime Champlain received in advance as part of the marriage contract 6,000 livres of Helen Boullé's inheritance.

He was in Canada in 1611 and decided to found a settlement at Montreal and in this season also he made a descent through the Lachine Rapids. Before this, one man had died in the rapids and only one man had made a successful descent. But Champlain was unable to carry out any extensive explorations and now for a year he was kept busy in France.

But his business in America was not left idle in his absence. It was one of the characteristics of Champlain's plan that he developed young men to work with him and that he inspired them to undertake long journeys among the Indians by themselves. It was men of this type who became known as *coureurs de bois* and *voyageurs*. Among the first of these were Nicholas de Vignau and an extraordinary youth named Étienne Brulé. Both spent winters among the Algonquins and other Indians learning their languages and living as they lived. In exchange, and as part of a compact, Champlain took a young Indian with him to France, developed him as an interpreter and returned him to his own people.

Brulé and Champlain in 1615 went up the St. Lawrence, entered the Ottawa River, left the Ottawa at its junction with the Mattawa and finally came to the margin of Lake Nipissing. They came out on a section of Lake Huron which is now called Georgian Bay. It was somewhere about this point that Brulé left to go on a voyage of his own to arouse some of their Indian allies. Champlain went on across the eastern end of Lake Ontario with a great war party of Indians. They made an attack on the Onondaga tribe of the Iroquois near Lake Oneida in New York State. Champlain had now entered the state twice, once on its extreme eastern border and once from the west. This long and roundabout journey had carried him over 800 to 1,000 miles of territory.

This was Champlain's last exploit. He returned to Quebec and devoted himself to the development of the colony. He had to surrender Quebec to the English in 1629 and to submit to being taken prisoner to England. But he lived to see the colony restored by the treaty of St. Germain-en-Laye in 1632. He returned to the city he had founded and died there in 1635.

ÉTIENNE BRULÉ (ABOUT 1592-1632)

IN the story of American exploration, Étienne Brulé is the embodiment of the young, romantic, impetuous adventurer. In Canada and the United States he traveled over thousands of miles of territory never before traversed by a white man. He was the first visitor among half a dozen different Indian tribes and the first to learn their language. He was so young when he began his career that he had little education or social knowledge. This may have helped him in learning Indian ways but it left him the servant of educated explorers like Champlain. Had he been able to keep a clear journal, he would be known today as one of the great American explorers. We remember him instead as a rather pathetic example of what may happen to the young, the courageous, the trustful.

He was about 16 years old when he sailed with Champlain and became one of the first settlers in Quebec. He stayed in Quebec for two years and then, at his own request, went off with some Algonquin Indians to learn about their language and the region they inhabited. The next year, that is the winter of 1611-1612 when Champlain took a young Indian with him to France, Brulé went in exchange to stay among the Hurons. He traveled with them, lived as they lived and learned their language. It is probable that at this time he reached Georgian Bay and was the first white man to see Lake Huron. He rapidly became an interpreter and linguist among the Montagnais, Algonquin, Nipissing and Huron tribes. In 1615 he accompanied Champlain up the Ottawa to Georgian Bay and across Lake Huron. It was at this time that he said good-by to Champlain and started off on his own great exploit.

Brulé set off in two canoes with 12 Indian companions. With them he crossed Lake Ontario and advanced into the wilderness. He was headed for Carantouan to summon help in fighting the Iroquois. On the journey he met a small party of Iroquois, killed several of them and took two prisoners along to the settlement. Carantouan was a palisaded town with about 4,000 Indians (probably Eries) settled in it; of these 800 were warriors.

Brulé recruited 500 of these warriors and started off to join Champlain. But there were so many delays that the battle was over and Champlain had withdrawn before Brulé and his allies arrived. Brulé therefore returned to Carantouan.

It was too late to rejoin Champlain and he saw no advantage in hanging about the Indian town, so he began a further voyage. From the town he followed a little stream and came to a fine river. This was the Susquehanna and in the autumn he followed this beautiful valley southward to the Chesapeake. That is, he crossed what is now the state of Pennsylvania and a part of Maryland and may even have reached into Virginia territory.

In the spring of 1616 Brulé returned to Carantouan and with several guides started off for the St. Lawrence. When he was well launched on this journey his little band was suddenly attacked by a large party of the Iroquois. The attack was so sudden that they all sought to escape in different directions and Brulé was separated from his guides. For several days he wandered in the woods alone, without food and unable to secure any. In his famished state it seemed clear to him that he must either starve or surrender to the Iroquois. So when he saw several of these Indians he gave himself up and depended on their kindness and his own wits. They hesitated at first and then took him to a village and gave him some food. They then asked him if he were not French. Indians referred to the Frenchmen as "men of iron." Brulé replied that he came of a better nation who were prepared to be friends of the Iroquois rather than their enemies. The Indians did not believe this and commenced to treat him accordingly.

Champlain gives in his narratives several passages which describe what it meant to be a captive of the Indians. He was witness to these things when he was campaigning in the region of Lake Champlain.

> "After going some eight leagues, towards evening they [Champlain's Indians] took one of the prisoners, to whom they made a harangue, enumerating the cruelties which he and his men had already practised towards them without any mercy, and that, in like manner, he ought to make up his mind to receive as much. They commanded him to sing, if he had courage, which he did; but it was a very sad song. Meanwhile, our men kindled a fire; and, when it was well burning, they each took a brand, and burned this poor creature gradually, so as to make him suffer greater torment. Sometimes they stopped, and threw water on his back. Then they tore out his nails, and applied fire to the extremities of his fingers and private member. Afterwards, they flayed the top of his head, and had a kind of gum poured all hot upon it; then they pierced his arms near the wrists, and, drawing up the sinews with sticks, they tore them out by force; but, seeing that they could not get them, they cut them. This poor wretch uttered terrible cries, and it excited my pity to see him treated in this manner, and yet showing such firmness that one would have said, at times, that he suffered hardly any pain at all. I remonstrated with them, saying that we practised no such cruelties, but killed them at once; and that, if they wished me to fire a musket-shot at him, I should be willing to do so. They refused, saying that he would not in that case suffer any pain. I went away from them, pained to see such cruelties as they practised upon his body. When they saw that I was displeased, they called me, and told me to fire a musket-shot at him. This I did without his seeing it, and thus put an end, by a single shot, to all the torments he would have suffered, rather than see him tyrannized over."

This is what was in store for Brulé. In his case they began by tying him securely and they tore out his fingernails with their teeth. They pulled out his beard in handfuls and began burning him with fire-brands. The chief of his little group of captors interposed in Brulé's behalf but carried no weight with his associates. Now it happened that Brulé, though his method of life had prevented him from being a very regular or devout Catholic, still wore about his neck an *Agnus Dei*. One of his torturers asked Brulé what this was and reached out to grab it from him. Brulé said, "If you take it and kill me you will yourself immediately die—you and all your kin." Just at this moment a summer storm broke, crashing about them. The superstitious Indians thought this was an answer and fulfillment of Brulé's statement and they fled in terror, not stopping even to unbind him. The chief who had spoken in Brulé's behalf later returned and Brulé was taken into their village. His wounds were dressed and he was kindly treated.

When he left, the Iroquois guided him for four days on his route and he later reached the country of the friendly Hurons. Champlain had left but had expected Brulé to continue his explorations. Brulé stayed for some time among the Hurons but found he was exhausted from his travels and from his sufferings. He went with the Indians to the St. Lawrence and met Champlain and told him the story of what had happened in the three years since they had parted in the country of the Hurons. Champlain urged Brulé, as opportunity offered, to continue his work of exploration.

In accordance with these instructions, in 1621 he took with him a Frenchman, Grenolle, and returned to the Indian town of Toanché in the Huron country. This time Brulé headed north and west. He went out along the shores of Lake Huron, passing French River and continuing along the Manitoulin Islands which stretched from east to west. He passed through a region from which Indians said they obtained copper. It seems reasonably certain that he entered St. Mary River and was the first white man to see the falls at "Sault de Ste. Marie." It is also supposed that Brulé reached Lake Superior, which he referred to simply as the "Great Lake." Some supposed that Brulé reached the western end of this lake near the present city of Duluth.

Brulé came back from this trip and for a season or so was seen about the valley of the St. Lawrence. He was here when Quebec was surrendered to the Englishman, Kirke. Brulé was apparently willing after this event to offer his services to the English and this served to arouse Champlain's ill will. In the later editions of Champlain's writings reference to Brulé's activity was omitted or, where mention was made of his exploits, he was referred to simply as a young man.

In 1633 Brulé was again among the Hurons, living completely as they did, a form of existence which had by this time become natural with him. He was at Toanché where he felt at home and regarded the Indians as his friends. But apparently they did not share his view of the matter. Brulé was suddenly attacked. He was probably tortured again and there was no Champlain present to end his pain with a musket-ball. Finally he was beaten to death with clubs. His remains made a feast for those whom he had regarded as his friends.

René Robert Cavelier, Sieur de La Salle
(1643-1687)

SOME men came to exploration from so poor and miserable a state in society that they were ready to risk any desperate venture. The wilderness could hold no terrors for them! But this was not the case of René Robert Cavelier, Sieur de La Salle, who came to Canada from a rich burgher family of Rouen and there spent all his own money and all he could raise in an attempt to develop an empire.

He had received a grant on the St. Lawrence about eight miles above Montreal and had built a stockaded village there when some traveling Senecas told him of a great river which began near their country and then turned southward. They also told him that it would take 8 or 9 months in a canoe to follow the course of this river to the sea. The story immediately awoke in La Salle's mind a picture of a great river which stretched across the continent, falling probably into the Vermilion Sea (the Gulf of California). He lost no time in selling his post to raise funds for an expedition and in 1669 his flotilla, consisting of 20 men and 7 canoes, set forth on the St. Lawrence and headed upstream.

With the object of obtaining guides from the Senecas, the canoes passed into Lake Ontario, followed the southern shore, and La Salle heard further reports "of a broad prairie land to the south, which stretched a long distance without trees." Passing the Niagara River, which they did not enter, they finally reached the extreme western end of Lake Ontario. Here he met Louis Jolliet, who had just returned from a copper-seeking expedition along the shores of Lake Superior which had carried him as far west as Sault Ste. Marie. Here, too, La Salle's missionary companions, the Sulpitians, took the trail to the Northwest, of which they learned from Jolliet. Little is known of La Salle's explorations at this time, for his journals are lost, but it is probable that during these travels he discovered the Ohio River, passed through Lake Erie, Lake Huron and Lake Michigan and went some distance down the Illinois River.

By 1673 he was back in Montreal. Meanwhile Jolliet had paddled down the Mississippi as far as the mouth of the Arkansas River. He had started in the spring of 1673 with Father Marquette and five *voyageurs* in birch-bark canoes. They had followed the Fox River and had made a portage into the Wisconsin River and by July 17th had entered the Mississippi. Having reached the mouth of the Arkansas and being convinced that the Mississippi flowed into the Gulf of Mexico, they turned back, returning to Quebec by way of the Illinois River.

Ever alert, La Salle now developed grandiose plans of following up Jolliet's explorations by tracing the river to its mouth and thus extending French power to the lower Mississippi Valley. The next few years were busy ones for La Salle in the development of his plan. He enlisted the aid of Count Frontenac, the governor, and went to France to obtain patents which would empower him to explore the West and give him the monopoly on buffalo-hides.

By 1678 he was back in Canada, accompanied by a faithful companion and supporter, Henri Tonty. He brought with him anchors, sails and cordage with which to construct a vessel for his enterprise, and the "Griffon" was finally launched on the Niagara River and sailed up the Great Lakes to Green Bay (Lake Michigan), where she arrived in September, 1679.

After building Fort Crèvecœur on Lake Peoria, which he planned as a base for further explorations, and after having sent Father Hennepin off to explore the Illinois itself, La Salle decided to return to Fort Frontenac for further supplies and equipment for new ships. The "Griffon" had disappeared with her cargo, and he was anxious to replace her so that there would not be too much delay in starting down the Mississippi.

Then followed a nightmare of a journey of 65 days through marshes and rivers during incessant rains and in the thawing spring weather. To these difficulties was added the constant danger of imprisonment by the Iroquois who were now on the warpath He covered 1,000 miles of trackless wilderness only to find when he reached Fort Frontenac that his agents had betrayed him and plundered him and that the canoe-loads of valuable furs which he had sent back had upset in the Lachine Rapids. Then, to make matters worse, La Salle heard that his men at Crèvecœur had revolted against Tonty, had taken supplies and wrecked the fort.

It was August before he could set out again. This time he took with him 25 men, among them ship-carpenters, masons, soldiers, *voyageurs,* etc., and went out by way of Lake Simcoe, Georgian Bay, the Manitoulin Islands, finally reaching Michillimackinac (Mackinac). Then began a search for Tonty. Although each was unaware of it, while La Salle was traveling along the eastern shore of Lake Michigan, Tonty was on its western shore. It was not until May, 1681, that the two again met at Michillimackinac.

After another trip to Fort Frontenac, again to assure his creditors and to raise additional funds, La Salle was back on the Illinois. He had now abandoned the plan of building a ship and intended to travel by canoe. He started in the middle of winter and the canoes had to be mounted upon sledges.

His party, now augmented by fresh recruits of Indians, went down the Illinois in December, 1681, but it was February before they finally entered the Mississippi. They found it full of ice. For a while this delayed them but on February 24th they came to the Third Chickasaw Bluffs, where they camped, hunted and built a small fort. Then they embarked again, drifting down the great river and pausing occasionally to examine its shores. As they went southward the weather grew warmer and the river broader. The current swept them on, and they had little paddling to do but they had to be on the alert for whirlpools, sandbars and floating timber.

On April 6th they found the river dividing into three branches. La Salle took the one to the west, Tonty the middle one, and D'Autray, the eastern one. Before they met again the water grew brackish and then salt and they detected the effect of tides. They had reached the Gulf!

They came together again on a small, dry island near the mouth of the river. Here, to the accompaniment of firing of muskets, shouts and the chanting of prayers, they erected a column and fastened on it the arms of France and an inscription which read: "Louis Le Grand, Roy de France et de Navarre, Règne; le Neuvième Avril, 1682."

Having taken possession for France and named the new territory Louisiana, they now turned homeward. The return upstream was slow, for they had to battle the current. La Salle was dangerously ill and this contributed to the delay. Food had run out, and often they had to eat the flesh of alligators. Finally, La Salle sent Tonty ahead to Michillimackinac with instructions to send news of the discovery to Canada and to return to him in Illinois. It was September before he succeeded in rejoining Tonty at Michillimackinac.

In the fall of 1682 La Salle started to carry out his plan for the establishment of a great colony on the Illinois River. He built Fort St. Louis (probably near the present site of Ottawa, Illinois) and settled down here for the winter with 20,000 Indians grouped around the colony, 4,000 of whom were warriors. Meanwhile things were not going so well for him in Canada. Frontenac had been replaced by La Barre as governor and La Salle got no support for his schemes. He therefore sailed for France in November, 1863, to try to interest the King in a plan to establish a fort at the mouth of the Mississippi and to seize the Spanish forts there.

He was given a commission and authorized to found colonies in the territory which he had named Louisiana. This land stretched from Lake Michigan to the Gulf of Mexico. He sailed with 400 men and 4 ships on July 24, 1684. Joined with him in authority was a naval officer, Captain Beaujeu. From the start the two did not get on well together; each hated to divide authority with the other.

Toward the end of the year the little fleet came into the Gulf and began to approach its northern shore. They thought they were near Appalache Bay but as a matter of fact they were about 100 miles west of the Mississippi in the neighborhood of Atchafalaya Bay. On January 6th they came into what was probably Galveston Bay. La Salle and his vessels lay here for a while, awaiting Beaujeu. When he did not appear, La Salle, thinking Beaujeu must have passed still farther west, moved in this direction. It is supposed that he came in to the coast near Matagorda Island, where he made a landing. Here he saw great plains with buffalo and deer and here he met Beaujeu.

Their disagreements began afresh. The expedition had various misfortunes: one vessel was captured by the Spanish and one was wrecked. Beaujeu decided to abandon the expedition and returned to France.

La Salle soon discovered that he had not reached the mouth of the Mississippi. However, he established a fort and colony which he named St. Louis on a river which he called La Vache (now the Lavaca). Near this site they found cannon, sword-blades, spear-heads and books, which showed that the Spanish had once had a post there. Once his fort was established, La Salle turned his attention hopefully to the great exploration which was to find the Mississippi and carry him northward to Illinois. In the fall of 1686 he made two attempts to move northward. Neither was successful and he consumed the time and energy of his men in useless wandering. Some of his followers finally united against him and assassinated him.

He had expended his life and fortune in traveling from the bleak rocks of Labrador to the bayous of the Gulf to establish as French territory a great domain that was the very heart of a continent. It is said that the brutal mutineers left his body to be devoured by the wolves. Had he been buried he must have risen in horror from the grave, when the "Royal Louisiana" he strove to create was finally sold to satisfy the ambitions of a vulgar, little Corsican general.

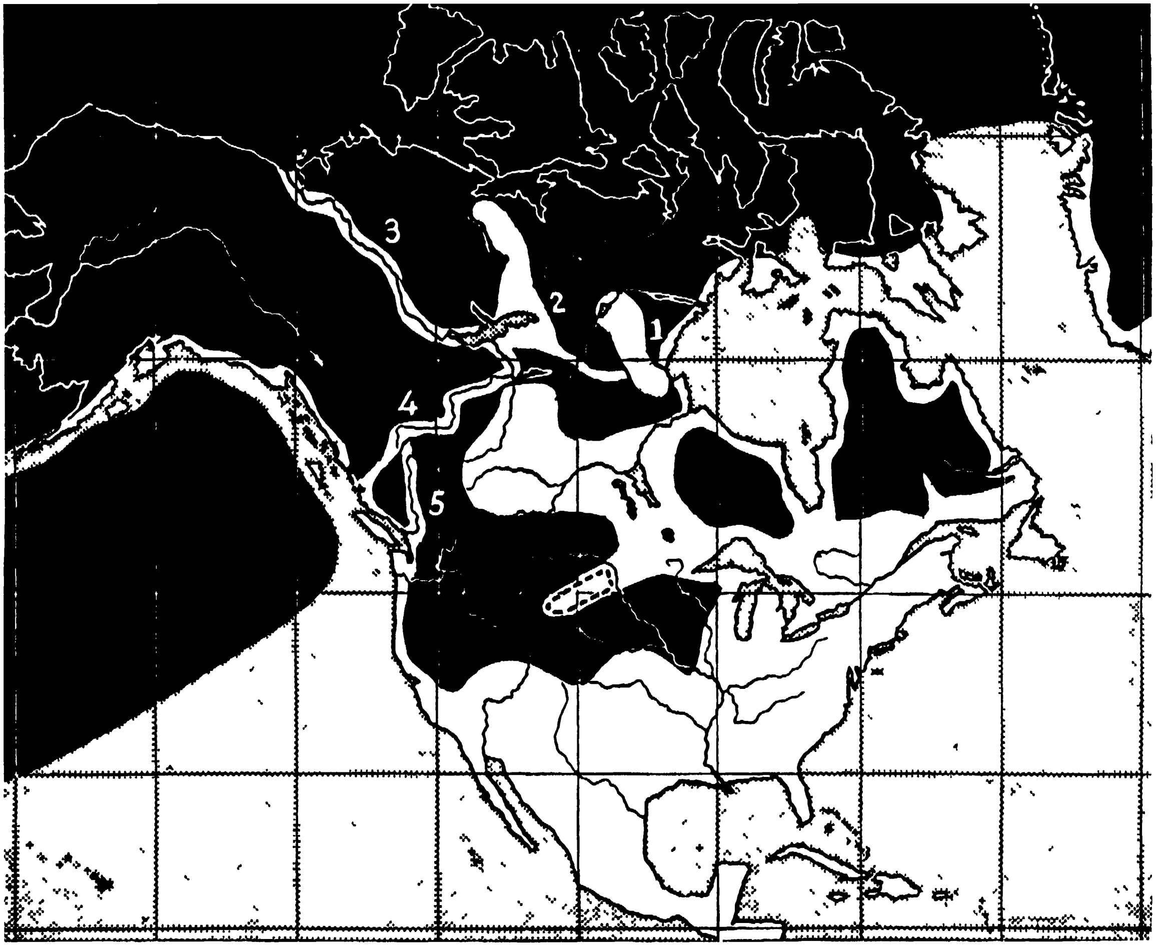
SAMUEL HEARNE (1745-1792)

"TAKE me to the land of the musk-ox where the mist is on the lakes and the loon cries very often."

The silence of snowy forests, the rapids of great rivers flowing northward, the desolate beauty of the barren lands, the hardships of travel in Arctic America are first made known to us in the experiences of Samuel Hearne.

He was a rough and ready traveler with practical objectives. Learning and science made little appeal to him. Indeed, it was his hatred of school work that brought him to the wilderness and his lack of schooling that made his work of less value than it might have been. His father had been secretary to the Waterworks on London Bridge and the boy was given an opportunity at learning. He was good at sports and brilliant at thinking up ways of escaping school. When he was 11 years old, he was allowed by his reluctant mother to go to sea.

As he expressed it, he "wanted to engage in some hazardous enterprise by which mankind might be benefited." With this vague but compelling motive constantly in mind, he succeeded in the field of adventure where he would have failed in some other enterprise. He resigned from the navy and persuaded the Hudson's Bay Company that he was just the man they were looking for to undertake a further search for the Northwest Passage. By the time he was 26 years old he was examining portions of Hudson Bay to see what they might contribute to the cod fisheries.



THE ENGLISH IN CANADA

(1) Hearne, 1770 (2) Hearne to mouth of Coppermine River, 1771-2 (3) Mackenzie to mouth of the Mackenzie River, 1789 (4) Mackenzie to the Pacific coast at Dean Channel by way of the Peace and Parsnip rivers, 1793 (5) Fraser down the Fraser River, 1805

He was to inquire into the character of the mines and also to see if any river offered a passage through the continent, for the hope that some connection between Hudson Bay and a western ocean might be found was still alive.

From Prince of Wales Fort, Hearne made a first journey in 1769. He had a mixed company of two English volunteers, two Cree Indians and several Chipewyans. The party was not a harmonious one and the Indians found a score of ways to delay his advance. Some of them finally deserted, taking food-supplies with them. Hearne retraced his steps to the fort.

His second trip started in February of 1770. This time Hearne took no Europeans with him, depending on the Indians. It was his intention to live and travel as they did. He made a desperate and cheerless departure. Before, the fort had fired a salute for him. This time the cannon on the ramparts were so deep in snow and ice that they could not be fired. He reached the Seal River, which makes its way into Hudson Bay from the west, and followed the course of this stream. His journey was monotonous and tiresome. Sometimes they had food and sometimes they went without. This was the only variation. He describes a meal as "a few cranberries, water, scraps of old leather, and burnt bones." The travel was all heavy going in the deep snow. He finally wintered at Lake Shee-than-nee.

It is difficult to trace the exact route Hearne followed, for, though he took astronomical observations, these were inaccurate. He was more or less at the mercy of his Indian companions and in characteristic fashion they spent the summer hunting caribou and musk-ox until the season was too advanced for travel to the Coppermine River, which was his objective. Also in August Hearne broke his quadrant and felt he should return to the fort for a new instrument. It was all very discouraging and it seemed as though he were stumbling from one delay and disaster to another. But he stumbled at last on a piece of good fortune.

On the way back to the fort he ran into a famous Northern Indian named Matonabbee. Hearne was then short of clothing, half starved and half frozen. The Indian cheered him up, fed him, clothed him and talked to him about travel in this great country. Hearne told the Indian about his intention to reach the Coppermine even if it cost him his life.

The old Indian liked Hearne's spirit and volunteered to go along but said they must do things differently. He said Hearne's guides had been pretty much to blame. The governor had also forbidden women to be taken on the expedition. In Matonabbee's opinion this was a cardinal mistake and must be changed. He gave his reason in this fashion: "Women were made for labour; one of them can carry, or haul, as much as two men can do. They also pitch our tents, make and mend our clothing, keep us warm at night; and, in fact, there is no such thing as traveling any considerable distance, or for any length of time, in this country, without their assistance. Women, though they do every thing, are maintained at a trifling expense; for as they always stand cook, the very licking of their fingers in scarce times, is sufficient for their subsistence."

They stayed hardly at all at the fort, for on December 7th Hearne and Matonabbee were off again. They would have no Home-guard Indians in their party. This offended the governor but he none the less gave them supplies. This time, on Matonabbee's advice, they traveled with dog-teams and sledges and took a southern course in order to avoid the Barren Lands. About the first of the year they reached Nueltin Lake and here they picked up the wives and families of Matonabbee and his men. The lake provided good fishing and was a sort of general camping ground and meeting place.

From this point they went through a succession of lakes and streams, traveling all spring, finding deer and other game plentiful. For once Hearne enjoyed traveling about with a full stomach. In May they had come to Clowey Lake and here they added to their party, though they did not wish them as companions, a considerable number of Indians.

Shortly after they left Clowey Lake they suffered a serious loss. One of Matonabbee's wives and a wife of another man deserted the camp. It seems they ran away to join former husbands from whom they had been taken by force. Matonabbee was loud in his grief for this left him with only seven wives. All of his wives were called Martin—there were Black Martin, Brown Martin, etc. A little farther along the trail it was decided to leave behind some of the women, the dogs, sledges and heavy equipment so that they might travel more rapidly. From this point on Matonabbee had to get along with two wives.

Despite their intention, progress was not rapid for the weather held on cold and snowy through the early part of June and the lakes were still frozen. They crossed Artillery Lake and Clinton-Colden. But game was plentiful so that progress was not too uncomfortable. They met the Copper Indians who received them in hospitable fashion, though they regarded Hearne as a rather ugly curiosity: "As I was the first white man whom they had ever seen, and in all probability might be the last, it was curious to see how they flocked about me, and expressed as much desire to examine me from top to toe, as an European Naturalist would a non-descript animal. They, however, found and pronounced me to be a perfect human being, except in the colour of my hair and eyes: the former, they said, was like the stained hair of a buffaloe's tail, and the latter, being light, were like those of a gull. The whiteness of my skin also was, in their opinion, no ornament, as they said it resembled meat which had been sodden in water till all the blood was extracted. On the whole, I was viewed as a great curiosity. . . ."

The party was again reduced and this necessitated a hunting expedition to provide the women and stragglers with food until the advance party should return. Some Copper Indians went along as guides. Now their way led in a steep and backbreaking trail over the Stony Mountains. Though it was early July they advanced in a downpour of snow and sleet and rain; everything was wet. There were no shelters but rocky caves which ran with water and hardly fire enough to light a pipe. On July 13th they reached a branch of the Coppermine River and later at Sandstone Rapids the river itself, which they found broad but so shallow that it would hardly support a canoe.

A few days later advancing spies reported that a camp of Eskimos was located ahead of them on the river bank. This was the real reason for which most of the Indians had accompanied Hearne's party—they wanted to fight. Survey work and exploration were completely forgotten. The Indians dashed off and fell on the Eskimo camp without warning. The Eskimos ran stark naked from their tents and before they could arm or equip themselves were struck down. A girl of about 18 ran near Hearne and he asked his Indian companions to spare her. Instead, they drove their spears into her body and pinioned her to the ground at Hearne's feet. They asked with great scorn if he would have an Eskimo for a wife.

The scene of this massacre was called Bloody River and the name is still preserved. Franklin found it in 1821 and Hanbury visited it in 1899 and found that the story of the massacre still persisted in local tradition.

From the scene of the massacre Hearne followed the river a short 8 miles to the sea. Here he erected a marker and took possession of the coasts on behalf of the Hudson's Bay Company. He started his return journey on July 18th and passed between the upper waters of the Coppermine and Yellowknife rivers to reach the northern shore of Great Slave Lake. Here he spent some time in hunting, circled the lake and arrived back at Prince of Wales Fort in June, 1772. He had followed the course of the Coppermine to Coronation Gulf and his combined travels had settled forever the hope that there was a western issue from Hudson Bay.

SIR ALEXANDER MACKENZIE (1763-1820)

IN 1780 there arrived in Montreal Alexander Mackenzie who was to carry on the kind of exploration that Hearne had initiated. He came straight from Stornoway on the Isle of Lewis and brought with him a great deal of earnestness and a desire to learn the fur trade thoroughly. Five years in a counting house in Montreal and another year in Detroit did not dull his enthusiasm. But who would have supposed that this serious clerk belonged to the company of great adventurers and that he had the strength and resolution to win his way across a continent?

At last in 1785 he started west and three years later reached Lake Athabaska where he built

Fort Chipewyan. Here his cousin Roderick Mackenzie joined him. From Lake Athabaska the Slave River ran into the Great Slave Lake and from the Great Slave Lake another river flowed. No one knew where this river ran but the geographers believed it emptied into the Pacific. The Mackenzies decided to find out if the geographers were right.

They assembled a small company of traders and Indian guides and hunters and in June, 1789, set off in canoes down the Slave River. They found the Great Slave Lake still clogged with ice and the weather miserably cold. The ice was too soft to walk on and too solid to permit the passage of a canoe. There was a long delay before they could start down their unknown river.

After they had started there were further difficulties. The Indians told long and dolorous tales about the difficulties of the river—stories about its great length, about impassable falls and horrid shapes and monsters that lay in wait for travelers. No one had even been down the river and come back alive. The Indians threatened mutiny and Mackenzie dealt with them firmly and simply, Scotch fashion.

In the early part of July the banks of the river were still coated with ice and the canoes made their way down the river in a narrow channel in the center of the stream. As the sun rose and the ice melted sections of the bank fell into the stream, often carrying along whole living trees. One day, looking over the frozen banks, they saw far beyond them one high mountain and then another and then a whole chain of them stretching along together, their summits lost in clouds. This was their first view of the Rockies, but thereafter for hundreds of miles they watched the mountains running along, roughly parallel to the river.

When they had started, Mackenzie had hoped that the river would take him westward but he had hoped in vain for it continued a northward course. Presently the river was shut in between lofty vertical banks that ran for miles and miles—the Ramparts of the Mackenzie.

The river seemed to run on forever. One night Mackenzie woke up and stepped outside of his shelter; then he promptly aroused his companions. Before them was a perfect and unclouded view of the midnight sun. Presently there were no more Indians to be seen, only the camps of the Eskimos. The river-banks decreased in height, the river spread out wider and wider and split into branches. They found a lake and in the lake they came upon an island. Mackenzie and one of the Indians climbed to the highest part of the island. From there they saw about them from the southwest clear around into the east a great expanse of ice. Ahead of them there were still little islands rising from the ice but they thought perhaps they had come to the end of their river and reached the frozen sea.

The island on which they stood was not destitute of life. There were numbers of partridges which were white in winter but had now turned brown. There were beautiful flocks of plover and a nest with four eggs in it and white owls also. Nor were signs of man missing amid the frozen waste, for there was a grave marked by a bow, a canoe paddle and a spear.

During the night they were sure they had reached the sea, for the rising tide nearly washed away their canoes and equipment. In the morning they saw whales in the bay and in their enthusiasm jumped into their canoes and paddled madly in an impromptu whale hunt. Luckily, the whales escaped.

On July 16th they started upstream again. Their food was scarce and progress against the current difficult, but they made the return without any disaster. One evening Mackenzie noticed ahead of him, along the banks of the river, great columns of smoke rising. He thought at first these came from brush fires. But they were really burning seams of low-grade coal or lignite. The Indians said these fires had been burning for years. They are still burning, year after year, the smoke swept low across the river by the icy gales of winter and rising straight and tall in the still air of summer nights.

Despite his success in reaching the Arctic by the new river, Mackenzie was not pleased with the result of his long trip. Only a river that ran to the Pacific would satisfy him. But he had learned two things: first, that a great mountain range lay to the west; and second, that the Peace River, a branch of the Mackenzie, might take him into those mountains. Beyond that he would have to trust to luck for a stream running westward. Before he started on his western trip however Mackenzie made careful preparations. He went to England for scientific study and he ordered a fort built on the Peace River to serve him as a point of departure.

He spent the winter of 1792-1793 at this fort and started up the river in May with six French-Canadians and two Indians, the whole party traveling in a 25-foot canoe built to be unusually light and strong.

They passed through the most beautiful country Mackenzie had ever seen. The river made its way through plains where as far as the eye could see great herds of elk and buffalo were grazing. And there were also beautiful stands of timber—white spruce, birch trees, poplars, alders and willows. Presently they crept within sight of the Rockies, the loftier summits first shrouded in cloud and then showing caps of spring snow. Travel on the river became more and more difficult, the peaceful stretches giving place to rapids and the rapids to cascades increasing in number with each mile they advanced.

Presently they were shut in the hills with all hands tugging at the tow-rope of the canoe, or cutting trails and carrying it around rapids.

At the end of May they reached a point where the river divides. The southeasterly branch is now called the Parsnip River and the northwesterly one the Finlay. Mackenzie, on the advice of an Indian guide, chose to follow the Parsnip to its source in a small lake. A portage of less than a thousand yards then carried them to a small stream flowing westward. Mackenzie was the first white man across the Continental Divide. The waters from the Parsnip Lake would eventually reach the little island in the Arctic Sea where he had camped 4 years ago. The waters of the little stream flowed into the Bad River, into the Fraser and so to the Pacific.

Down the western slope to the Pacific, Mackenzie followed the Fraser system a short distance. Indians warned him of the danger of the river and of hostile tribes on the coast. Their canoe was wrecked in river-rapids and the whole party was nearly drowned. They stopped to build a new canoe. They left the Fraser River and followed the Blackwater River and presently they had to abandon that and carry 90-pound packs overland until in mid-July they reached the Bella Coola stream. They were cheered by coming among Indians who used bits of iron and pieces of European cloth. One Indian child had earrings made from an English halfpenny and a coin of Massachusetts dated 1787.

They passed down the Bella Coola into the North Bentinck Arm where the presence of seal, otter and porpoise showed them that they had arrived at the Pacific. Despite the hostile Indians they reached Point Menzies where Vancouver had been just a few weeks earlier. They camped for a night on a rock where they could defend themselves against the Indians. But they were not attacked and in the morning Mackenzie mixed up some vermilion with melted animal fat and wrote on the face of a rock:

"ALEXANDER MACKENZIE, FROM CANADA, BY LAND, THE 22ND OF JULY, 1793."

By August 24th they were back at the Peace River after a rather uneventful journey over the route by which they had gone out.

This ended Mackenzie's work of exploration but he continued his career as an officer of the big fur companies. Beyond this he fostered as best he could the commercial and imperial development of the American continent under English rule. He returned to England in 1801, published his journals and was knighted in 1802. He served a term as a member of the Canadian parliament and later married and retired to an estate in Scotland.

DAVID THOMPSON (1770-1857)

DAVID THOMPSON has no great single, spectacular adventure to his credit. He did not, like La Salle, follow a river to the Gulf of Mexico, or like Mackenzie, follow one to the Arctic Sea. He began his life in obscurity and poverty and he ended it in the same state. History has neglected him, yet he made a tremendous contribution to exploration in America.

Thompson was the son of a poor family in London and was educated as a charity scholar in the Grey Coat School. The Hudson's Bay Company sought from the school four young scholars to become surveyors at its Canadian posts. There were only two boys able to qualify and Thompson was one of these. The post to which he was sent was under command of Samuel Hearne.

By the time Thompson was 20 years old he was a competent surveyor and had embarked upon a life-time career of exploration. From this time on he was never separated from his surveying instruments, so that the Indians over great territories knew him as Koo-Koo-Sint, "The man who looks at the stars." They admired his tremendous energy and courage and felt he drew supernatural power from the heavens.

Thompson's travels were so extensive that we cannot follow them in detail. For 40 years he was engaged on pioneer surveys in Canada and parts of the United States. The territory he covered stretched from Hudson Bay to the Pacific and from the Peace River to the banks of the Missouri. In United States territory, he made two interesting contributions: he surveyed the headwaters of the Mississippi River and virtually located its source; he traveled completely around Lake Superior and made a map of the region. By canoe and forest trail he traveled over 50,000 miles in the heart of the American continent.

These mere figures do not give a measure of his accomplishments. He was not simply traveling from place to place, content with mere success in arriving at his destination. On every journey he was carrying out a whole chain of duties. He made observations and ran traverses so accurate that he could draw good maps of the region through which he passed. He made reports on the commercial resources of these regions. He kept a record of Indian tribes and customs. In addition to this he was a successful commercial trader and built a score of trading posts.

He made a long journey in the Pacific coast regions west of the Rocky Mountains. This was only two years after Lewis and Clark had reached the mouth of the Columbia in 1805. He established a post on the Columbia River and a year or so later he built another on the Pend d'Oreille Lake and carried out many surveys from this point. In 1811 he made another trip to the Pacific during which he discovered and named Athabaska Pass. After the War of 1812, he was engaged for many years on the boundary survey between Canada and the United States. He completed his work in 1826. He was then 56 years old and wished to retire but his labors had been so poorly rewarded that he had to seek employment as a surveyor.

Thompson summarized all of his labors in his *Narrative* and in his Journals but these were never published and he derived no profit from them. He prepared for publication a great map that embodied the results of his various surveys but this also remained unpublished. It hung for many years in the hall at Fort William and later became a part of the Ontario archives. Though Thompson was otherwise forgotten, many official and other printed maps were based on his work. When he could no longer continue his work as a surveyor Thompson became so poor that he had to part even with his surveying instruments in order to buy food. The meals so purchased must have seemed to him a more bitter diet than any he had to endure through all his years on the trail. He lived in poverty and obscurity until 1857.

OTHERS IN NORTH AMERICA: CANADA

JEAN NICOLET, like Brulé, was one of Champlain's young associates. Also, like Brulé, he was illiterate and untrained. In 1634 Champlain sent him out to prospect for a way to the "Western Ocean." He passed up Lake Huron to Michillimackinac, crossed Green Bay, followed the Fox River to the Wisconsin portage and reached the Mississippi.

PIERRE RADISSON between 1658 and 1662 carried out extensive travels in the regions of the Great Lakes. He left reports about his travels but there has been considerable debate about the extent and even authenticity of some of his routes. He reached the Mississippi and seems to have known about the Missouri River. In 1662 he visited the Lake Nipigon region and possibly James Bay. Later he visited the Hudson Bay posts.

DANIEL DULHUT in 1678 and 1679 was another early traveler in the Lake Superior region. The city of Duluth was named after him. His chief usefulness was not in exploration but in his unusual capacity for dealing with the Indians. His courage and experience permitted him in 1679 to rescue the missionary Father Hennepin from the Sioux.

HENRY KELSEY was a wild and curious youth in the employment of the Hudson's Bay Company. From their posts in the years 1689 and 1692 he carried out western journeys, traveling alone among the Indians. He wrote strange reports of his activities, parts of which are given in uncouth verse. The quaintness of the language which he employs adds an interesting note to his reports but makes it a difficult matter to follow his routes, so that doubt has been cast on the authenticity of his travels. It appears, however, that he had considerable knowledge of Indian life and that many of the facts he reports are well-grounded. He traveled from the Churchill River toward the Barren Grounds, encountered the musk-ox and gives one of the first descriptions of this animal. He seems also to have reached the Saskatchewan and to have gone a little west of Lake Winnipegosis and Lake Manitoba to the Assiniboine River and to have made the acquaintance of the Assiniboine Indians. He was probably the first white man to hunt the buffalo in this region.

ANTHONY HENDRY, some 60 years after Kelsey, extended the knowledge of the region. Starting from York Factory on Hudson Bay, he reached the valley of the Saskatchewan.

He traveled by canoe up the Saskatchewan River as far as The Pas. Later he traveled by land between the north and south branches of the river. He spent a winter among the Blackfeet Indians who achieved such a reputation for hostility to white traders and travelers. Hendry had no difficulty with them and returned safely.

SIEUR DE LA VÉRENDRYE'S travels began in western Canada in the 1730's. He was a native of Canada and a man of some means, all of which he devoted to exploration of the West and to a determined effort to reach the "Western Ocean." He prepared himself carefully for this task and devoted years of study and labor to the undertaking. Three of his sons joined him in his enterprises and also a nephew, La Jemeraye. He built Fort St. Charles on the Lake of the Woods. The nephew died of exposure in the severe winter of 1735, and the succeeding winter his eldest son was murdered by the Sioux. Even these tragedies did not prevent La Vérendrye from continuing his explorations. In 1736 he built Fort La Reine on the Assiniboine River (this is now the site of the city of Portage la Prairie). From this base, following an Indian trail, he reached the Mandan villages on the Missouri River. Some years later two of his sons started from the Mandan villages in a southwest direction with a war party of Indians. They traveled extensively and probably came to the edge of the Rocky Mountain region. The war party, panic-stricken, abandoned their expedition and turned back. They had to turn back also.

Later from Lake Winnipegosis La Vérendrye pushed his explorations in a northwestern direction. He followed the Saskatchewan as far as the Forks before he had to abandon this attempt and return to Montreal. He died there in 1749 and, though they were anxious to do so, his sons were unable to carry his work forward.

The Vérendryes were first to descend the Winnipeg River, the first on Lake Winnipeg and on the Red, the Assiniboine and the Saskatchewan rivers; and, with the possible exception of Kelsey, they were the first to cross the great plains to the Missouri.

SIMON FRASER extended the work on the Pacific slope that had been initiated by Mackenzie. With his companion, John Stuart, he crossed the Rocky Mountains, traveling by way of the Peace River in 1805. Three years later, under instructions from the North-West Company for whom he was working, he followed the course of the river that bears his name to the sea. This was a passage of the most extraordinary difficulty carried out with great courage in spite of many hardships encountered. It was Fraser who named the Thompson River in honor of his fellow explorer. Fraser thought he was following a stream which would turn out to be the Columbia River, in reality the Fraser, and in its exploration he added greatly to the geographic knowledge of one of the great rivers of the Pacific coast.

UNITED STATES

BEFORE America became a nation, the Spanish, the Dutch, and the French had marked the limits of the continent and revealed its general character. Ponce de Leon had sailed to Florida. Pineda and De Vaca had defined the outline of the Gulf and crossed the states of the southern border to the Gulf of California. Coronado had ridden through the Southwest and come well into the plains area. De Soto had made his wandering march through the southeastern woodlands. La Salle had cut the country in half from the Canadian border down the whole length of the Mississippi Valley to the Gulf. Cabrillo and other Spanish navigators and Drake had examined the Pacific coast. There was left then for purely American exploration the vast prairies and the mountainous plateau lying between the Mississippi River and the Pacific coast.

The opening up of the West was not so much a matter of individual exploration as it was an expansion of people across the continent. There were social forces at work that set families and even whole towns moving westward. In this migration many people and many motives played a part. Hunters and trappers followed the migration of animals into new regions. Farmers went to find free land or better land. Religious zealots marched in companies to a promised land where they might without interruption develop the religion of their choice. Gold seekers rushed from one district to another in search of sudden and miraculous wealth.

All had a part in a vast movement. Often the explorer was only a step or two ahead of the thronging procession.

THE STORY OF THE "COLUMBIA"

AMERICA had hardly become a nation and settled down after the Revolution when the accounts of Captain Cook's voyages in the Pacific were published. Cook had seen the beauty and richness of the northwest Pacific coast and had spoken of the great possibilities for the fur trade in that region. It was a small group of American business men in Boston that were moved to take a chance on the possibilities that Captain Cook had pointed out. These men purchased the American-built ship "Columbia," 212 tons, and the sloop "Washington," 90 tons, and fitted out an expedition for the coast.

The vessels sailed from Boston in 1787 and, having touched at the Cape Verde Islands, passed around Cape Horn and reached Nootka Sound in September, 1788. They wintered on the coast and collected a rich cargo of furs. Captain John Kendrick, who was in command of the expedition, decided to remain on the coast in the sloop "Washington," but he instructed Captain Gray to return home with the "Columbia."

Gray took the "Columbia" to the Hawaiian Islands and then to Canton where the furs were sold. The ship was loaded with tea and sailed for Boston by way of the Cape of Good Hope. With her cargo from China she arrived in Boston August 10, 1790, and became the center of a second and merrier Boston tea-party. She was the first ship to sail around the world under the American flag and her arrival was the signal for great popular enthusiasm and public rejoicing. She had covered about 49,000 miles. Though the venture had not proved a commercial success, the owners decided to send the "Columbia" out again.

Gray sailed in September, 1790, and reached the west coast in June, 1791. Here on Clayoquot he built Fort Defence and here, during the succeeding winter, he built a sloop of 44 tons which he christened "Adventure."

In the spring the "Adventure" was sent northward to collect furs. Gray and the "Columbia" sailed southward. As he was passing within sight of the coast he noticed a white ragged line of tremendous breakers. Gray was a careful seaman so he noted that the latitude by his reckoning was 45° 10′ N. and began speculating as to the cause of such breakers. He concluded that they marked the bar at the mouth of a great river. He tried several times to sail over the bar but each time was set back by the tremendously strong current. Altogether he spent 9 days hoping for the right winds for the crossing. Then, at the end of April, near the Straits of Fuca he met the ships of Captain Vancouver who had just arrived from England with three vessels to explore the coast. Captain Vancouver said he had made no discoveries up to that time. He also had seen the breakers but had not thought them worthy of investigation. Captain Gray on his part said he felt sure he had made an important discovery and told of his efforts to get over the bar.

Captain Gray started for his breakers again early in May. He discovered and named Bulfinch Harbor, which is now called Gray's Harbor in his honor. On May 11th he again found the entrance to the river and this time with a favorable wind ran through the breakers and sailed 11 miles up the great stream and anchored. Here he found a great number of friendly Indians. He sailed 15 miles farther to assure himself that he had indeed come upon a navigable river. Finally he landed at the mouth of the river and raised the American flag and named the river in honor of his ship "Columbia."

Gray made a chart of the coast and the river entrance but it took a great deal of travel and adventuring to identify the upper course of this greatest of Pacific river systems.

MERIWETHER LEWIS (1774-1809) AND WILLIAM CLARK (1770-1838)

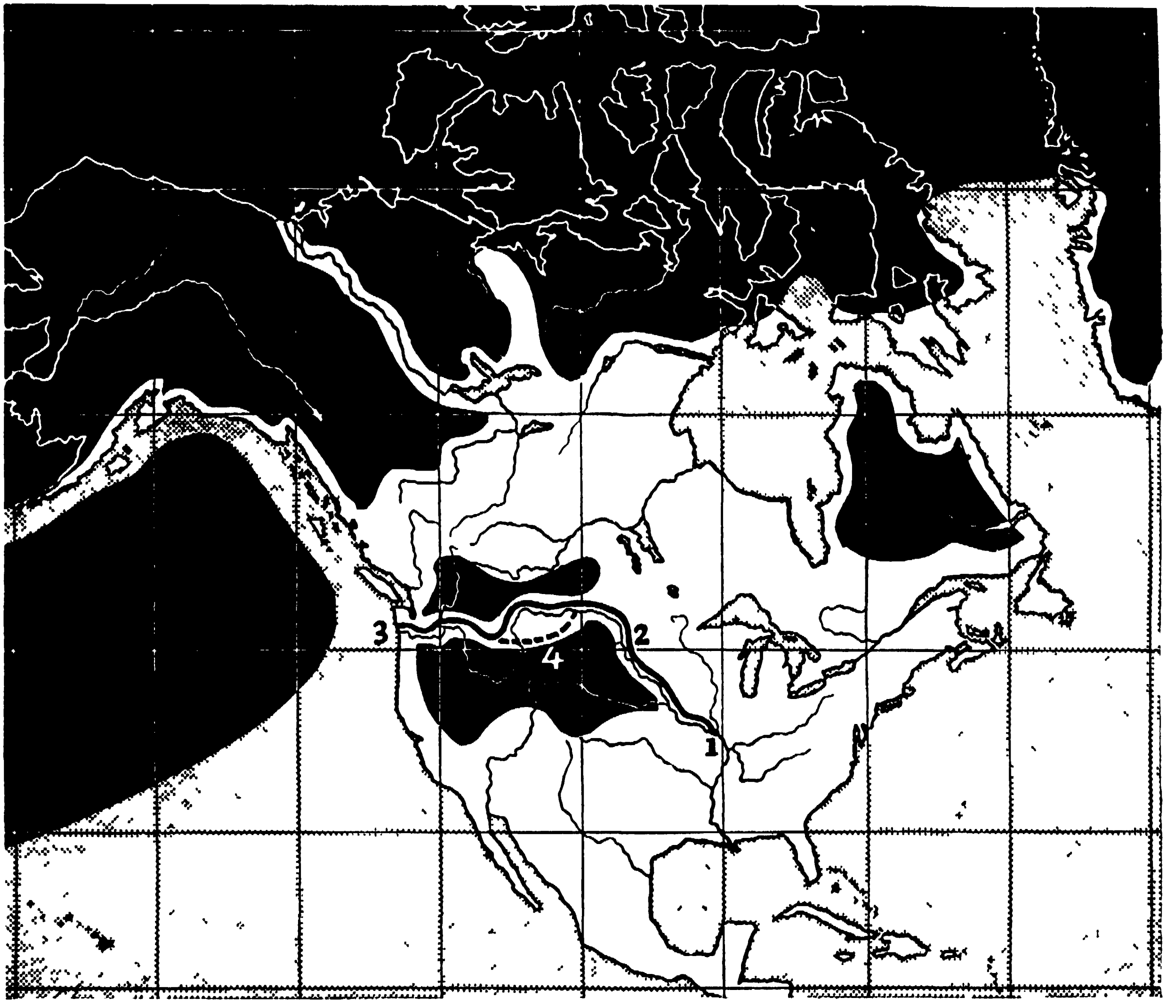
IN 1803 the United States government was ready to play an official part in exploration. Jefferson, who was then President, was aware that the great fur-trading companies of Canada were pushing out rapidly into the Pacific coast regions and that their trade with the Indians was a profitable and far-flung enterprise. It seemed high time that the government should be officially informed about the unknown country that lay beyond the expanding western frontier.

Jefferson organized an expedition and his instructions assigned it an ample program. It was to explore and "trace the Missouri to its source, to cross the Highlands, and follow the best water-communication which offered itself from thence to the Pacific Ocean." It was also to report on the soil, climate and conditions of the country and to study the customs, languages and traditions of the Indians. There was great uncertainty as to what might happen to such an expedition, but Jefferson left it sufficient freedom of action. If it succeeded in getting to the Pacific, it might use its own discretion in finding a way back, sailing either by way of Cape Horn or by way of the Cape of Good Hope or returning overland.

There was great popular interest in the enterprise. The Louisiana Purchase was then under discussion. America was just beginning to discover itself, and it seemed likely before it even started that the expedition was destined to play a great part in the development of the West.

Jefferson selected as the leader of this expedition a young man who had been serving him for two years as secretary. This was Meriwether Lewis and he had many qualifications for the job, not the least of which was his ardent enthusiasm for the project. It was on his own earnest appeal that Jefferson made the appointment.

For years the Jeffersons and Lewises had been friends as well as neighbors near Charlottesville, Virginia, where Lewis had been born in 1774. As a boy he had spent long hours in tramping and hunting in the woods and had acquired a remarkable knowledge of American plants and animals. He had operated his mother's farm with great success and had served in the militia when Washington called it out in 1794 to take part in the Whiskey Insurrection, later joining the regular army. His advancement had been rapid and at twenty-three he was a captain.



LEWIS AND CLARK

(1) Wintered at St. Louis, 1803-4 (2) Wintered at Fort Mandan, 1804-5 (3) Fort Clatsop (Astoria), where they wintered 1805-6 (4) Return route of Clark by the Yellowstone River, 1806

Lewis selected as his companion in the enterprise William Clark with whom he had served in the Army. Clark, too, had been born near Charlottesville of a pioneer family, but they had long since removed to Kentucky where they were among the early settlers. Clark, a brother of the noted George Rogers Clark, had served under General Anthony Wayne in the wars in the Northwest Territory, in which Lewis had also participated.

Before starting out on the expedition, Lewis went to Philadelphia for intensive training in the natural sciences and study in the current methods of astronomical observation and survey work.

The expedition spent the winter of 1803-1804 in an encampment on the eastern side of the Mississippi opposite St. Louis. In the winter quarters there were 29 men, 14 of whom were soldiers, and in the spring 15 boatmen were added and one Indian hunter and interpreter.

The expedition broke camp and started out on May 14, 1804. They traveled in two large canoes and a river batteau, making their way up the Missouri. Through the summer they pushed along up the river. It was all new ground to them and rough going, but they went on without arguments and without accidents. Early in November they saw from the stream the villages of the Mandan Indians. The city of Bismarck, North Dakota, stands there today, but then there was just the river and the plains and the settlement of the Indians. Along the north bank of the river they found a grove of great, stout cottonwood trees. The trees were standing thick together, offering protection enough even in winter. Lewis and his men decided to make their camp here.

In three weeks of smart work they built two rows of huts. The huts stood at right angles to each other so as to make a little square. They christened it Fort Mandan and figured out that they were 1,600 miles distant from St. Louis.

They spent five months at Fort Mandan—not bad months, either. There was plenty of game, and they used to go hunting. A good amateur blacksmith in the party set up a forge and made tools and trinkets and traded these with the Indians for corn and for food. The Indians visited at the camp and they all got along well together; and by spring, when the Americans were ready to go on, they found they had made many friends. But they had work to do before they took to the stream again.

The big batteau seemed too clumsy to manage further up the river, so they spent the month of March building six canoes to replace it. The canoes were built out of green cottonwood planks. They knew at the time that this was no good but there was no other wood available and they had to do the best they could. When the canoes were finished, they sent the batteau back down the river with 7 soldiers, 2 Frenchmen, and a Mr. Gravelines who acted as pilot. The journal says it "sailed for the United States loaded with our presents and despatches."

While they were at camp a French-Canadian by the name of Charbonneau kept coming around with his Indian wife and baby. The Frenchman talked a lot but seemed of limited value. The squaw might be of some service. It seemed she came from the Shoshone who lived far in the West and had been a captive among the Mandans until Charbonneau married her. She had traveled widely and might be of service as interpreter and guide. Besides, she would serve as a flag of truce, for Indian women were never allowed to join a war party. Lewis decided to take Charbonneau and Sacajawea along. They started up the river again.

By the end of April they had passed the spot where the Yellowstone joins the Missouri and had come into the country where there were great herds of elk and buffalo. The buffalo were so tame that they got in the way of the party and the men had to drive them away with sticks and stones. Grizzlies were there, too, but not so tame. They nearly accounted for a number of casualties. The river navigation got more and more difficult and the cottonwood canoes had soaked up so much water that they were heavy and unmanageable. One nearly sank and, as luck would have it, this was the one that had in it all the records and instruments. They saved it just in time. Before the end of May the great Rocky Mountains were in sight. They had to abandon the oars and come ashore towing the heavy canoes behind them.

Often the banks gave way to cliffs and then the party had to wade or swim for it. In early June they reached a point where the Missouri seemed to divide into a northerly and a southerly branch. Here they moved very cautiously. Lewis explored the northern fork and Clark the southern one. They were very anxious to select the stream which would run farthest and carry them nearest the headwaters of the Columbia River. Lewis concluded that the north branch was not the main stream and christened it Maria's River. He followed up Clark's exploration of the southern branch until he heard the Great Falls of the Missouri. Before leaving the junction of the rivers they abandoned and hid one of their original canoes and also cached great amounts of goods and ammunition.

The weather was hot and travel was now difficult, and the men were tired with the continuous walking and carrying of heavy burdens. But they proceeded with reasonable cheerfulness. They had brought along a metal framework over which they planned to stretch hides and so to make a large, light boat. The scheme proved impractical, and they had to leave the framework behind and build other canoes instead.

On July 25th they came to three forks of the river. The southeast branch they named the Gallatin, the southerly one the Madison and the southwest branch the Jefferson. On account of its size and direction they decided to follow the Jefferson. In addition to the difficult and steep going, they now added the hardship of hunger. Up to this time game had been plentiful and all the party well-fed, but now they were beyond the summer range of the deer and buffalo. Birds and small game served merely to leave the party in a semi-starving condition. But they pushed on and in the middle of August reached the source of the Missouri. From here they followed an Indian road through some hills. Westward they saw great ranges of snow-covered mountains. The brook at their feet ran westward and they knew they had crossed the Continental Divide. The brook ran into the Lemhi River and the Lemhi into the Columbia.

They had not gone far across the Divide when they ran into some Indians and Sacajawea found a long-lost friend. This girl had been with Sacajawea when they were both captured but had escaped and gone back to her own people, the Shoshone, and now Sacajawea learned that her brother had become the chief of her tribe.

The party now had to abandon much of its equipment and proceed on ponies that they had bought from the Indians. September found them still struggling through lofty mountains. They were half-starved and had to fight their way through a heavy snowstorm before they reached the Nez Percé Indians. Here they had a feast of fish, roots and berries. They had had so little to eat that the unaccustomed food made them all ill.

They reached the Clearwater River and abandoned their horses for canoes. In the canoes they rushed down through the rapids, making speedy but dangerous progress. In mid-October they reached the Columbia and on November 7th caught a glimpse of the Pacific and heard the roar of breakers. The next day the ocean swells came in and made them all seasick, but they hardly minded that, for they were sure now they had reached the end of their journey.

They had had permission to come home any way they chose, but there was no choice: they were so late in the season that all the trading boats had left the coast. In an improvised camp, Fort Clatsop, they spent a terrible winter, very different from the one at Fort Mandan. First it rained and then it turned cold. They were hungry most of the time and suffered also from fever. The Indians were greedy and difficult to deal with.

As early as they could in the spring they started back. This was the 23rd of March, 1806. They were still short of food when they reached the Nez Percé Indians in May. De Vaca had made a reputation for himself among the Indians as a doctor, and Lewis's party did the same thing among the Nez Percé Indians, exchanging their informal knowledge of medicine for food and supplies. They recovered their horses here and started east in June, well-mounted and well-provisioned. They followed the Clearwater and then the Snake River through the Bitter Root Mountains.

On July 1st the party separated. Lewis with 9 men took the direct route to the Falls of the Missouri and later he was to explore Maria's River. The rest of the company went with Clark to the head of the Jefferson River. Here Clark's party in turn was to divide, part of it going down the Jefferson and the remainder continuing with Clark to the Yellowstone. These operations were successfully carried out and all the parties were reunited on August 12th at the junction of the Yellowstone and Missouri rivers. On September 23rd the whole expedition arrived at St. Louis and "received the heartiest and most hospitable welcome from the whole village."

It had been a great expedition. They had covered 8,000 miles of unexplored territory. There had been plenty of difficulties, but none of them had been due to disagreements or human failings. Lewis and Clark were as firm friends as when they had started. Congress rewarded them both with large grants of land, and when Lewis found he had been given a larger share than Clark he protested vigorously.

Lewis became governor of the northern portion of Louisiana territory and commenced a successful career in this capacity, but he died in 1809 while making a journey to Washington. At the time he was in a cabin in the backwoods of Tennessee and there is some uncertainty as to whether he was murdered or committed suicide.

William Clark went on to a long and honorable career in public service in the frontier communities of the West. He was appointed governor of Missouri territory and served until Missouri was made a state and admitted into the Union in 1820. Two years later he was appointed Superintendent of Indian Affairs by President Monroe and served in this capacity for 16 years. He became known to generations of Indians as their friend and protector.

Zebulon Montgomery Pike (1779-1813)

While Lewis and Clark were working their way to the Pacific coast, Zebulon Pike, a descendant of a Revolutionary family, was extending American exploration in other directions on behalf of the United States government. Pike, then a young lieutenant in the Army, was sent by General Wilkinson to take a small military party and explore the upper main branch of the Mississippi River. It was intended that his expedition should open a pathway for trade in the Northwest and should impress the Indians and also the foreign traders with the activity and the growing importance of the United States government.

Pike started out from St. Louis in August, 1805, to travel up the river with a party which included besides himself a sergeant, a corporal and 17 privates. For a while they proceeded up the river in a 70-foot boat which served to accommodate them as well as their arms and ammunition and a four-month supply of provisions. They had great difficulty in passing the Demoyne (Des Moines) Rapids but finally arrived at Prairie du Chien in the early part of September. Here Pike found his large boat too unwieldy and substituted two lighter craft for it.

On the St. Peter's River he held a council with several Indian chiefs of tribes which owned the lands in that region. He purchased from them 100,000 acres of land for the government at a cost of $200. Soon after he reëmbarked his party and by the middle of October, when he was about 230 miles above the Falls of St. Anthony, he chose a site for a winter station. He had been finding progress extremely difficult; the nights were frosty and flurries of snow frequent. He had been pushing forward with all possible speed and the men were exhausted and some began to show signs of illness.

Two canoes were built in a brief, two-week period during which the station was established. Pike then decided to push on again with a few men. Hardly had the canoes been loaded when one of them, which unfortunately contained most of the ammunition, upset and sank. An attempt made to salvage the ammunition and dry out some of the powder resulted in an explosion but in no casualties; but the accident occasioned some delay and it was December 10th before Pike was able to proceed.

Their progress was slow, for they had to travel both by canoe and by sled. When the river froze over and canoe progress was impossible, the men hitched themselves to the sleds and hauled them along. Their progress was necessarily slow, for the sleds were heavily weighted. Pike, despite these difficulties of travel, kept the men cheerful and proved a resourceful commander. He was hunter, spy, guide and commanding officer, all at the same time.

With better ice conditions travel was speeded and on the first of February the party arrived at Lake La Lang Sue (now Leech Lake). Here Pike received a hospitable reception from a British trading post and on Red Cedar Lake, which he also visited, he held a council with the Indians and made them acquainted with the conditions of United States rule and the circumstances under which they were to live. He regarded these two lakes as forming the sources of the Mississippi.

In the middle of February, 1806, Pike turned downstream again and picked up the remainder of the party at the stockade he had built, and by the end of April he was back in St. Louis.

General Wilkinson was so impressed with Pike's success that in July he sent him on another mission toward the southwest. It was part of his duty to return Indian captives to their own tribes and to establish contact with other tribes, such as the Yanctons, Tetans and the Camanches. He was also to make astronomical observations and report on the nature of the country and people.

Pike with a large party embarked in 2 large boats on the Missouri, starting from St. Louis July 15, 1806. By August he was able to deliver his Indian captives to their own tribes in the Osage country. Here he abandoned the river and crossed the divide that lies between the Missouri and the Arkansas rivers. By October, when he had come among the Pawnees, he found the Indians unfriendly. This he attributed to their reluctance to change from Spanish rule to American rule.

Pike continued beyond the Arkansas and here encountered wild horses, great herds of buffalo and elk—"their numbers exceeded imagination." The weather was cold, and it continued to get sharper as he advanced into the uplands. By the middle of November he had followed the Arkansas to its headwaters among the Rocky Mountains.

It was November 15th when he saw the first chain of mountains which he described as the "Mexican mountains." A few days later he traveled to the base of the lofty peak which now bears his name. In his search for the Red River he came to the South Platte, later coming to the Rio Grande del Norte (Rio Grande). His pursuit of this stream had carried him into Spanish territory and here he and a small number of his men were taken prisoners by the Spanish authorities. From Santa Fé Pike was dispatched to Chihuahua in Mexico, traveling under escort. He succeeded in clearing himself and was allowed to return to the United States through the province of Texas. Although he had been forbidden to take astronomical observations, or any other observations, he succeeded in smuggling through notes which helped to complete his journals and which included descriptions of the country through which he had traveled.

Pike, who had been given up for lost, received an enthusiastic welcome on his return. His distinguished military career was cut short in the War of 1812. He was present at the capture of Fort York (now Toronto). The British, retreating, set fire to their powder magazine and Pike was killed in the explosion.

Pike's travels, coming as they did immediately after the Louisiana Purchase, supplemented the work of Lewis and Clark and added new information about United States territory, both in the North and in the South.

JOHN CHARLES FRÉMONT (1813-1890)

FRÉMONT was one of the last and greatest of the travelers and surveyors who helped to open up the American West. He traveled farther and mapped more territory than any American in the 19th century. But it was only occasionally that he crossed regions not previously reached by white men. More frequently he was simply fixing a route that had already been tried experimentally. His claim to fame rests chiefly on the extent of his travels and the character of his reports.

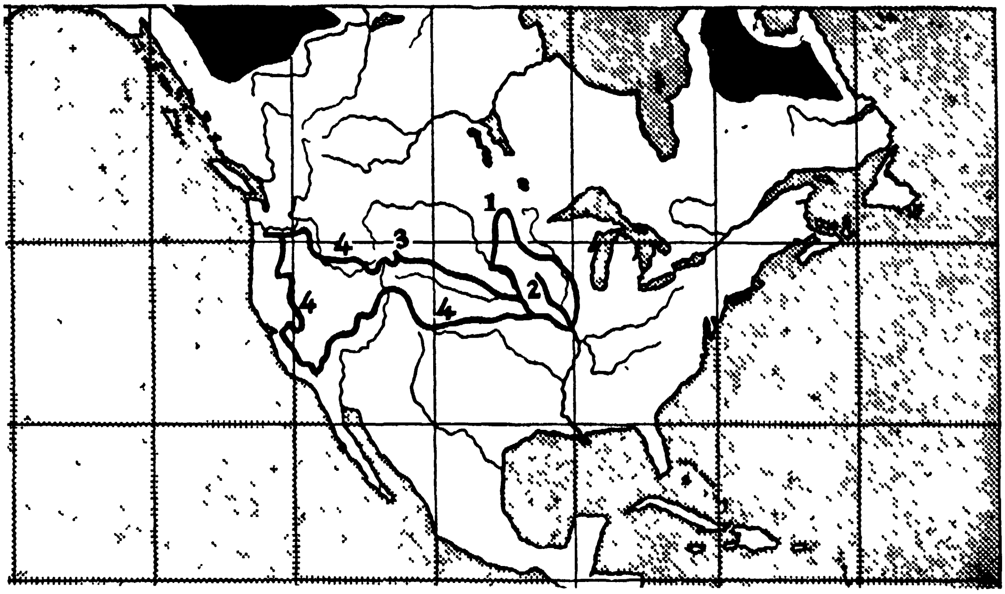
Frémont was a restless and picturesque character, as were most of the men associated with him in the West of that time, such as Kit Carson, who frequently traveled with Frémont as guide, Godey, and Preuss, the patient and careful cartographer who followed Frémont faithfully and turned out for him such excellent maps.

He undoubtedly inherited his restlessness and roving character from his father who was an attractive, unscrupulous Frenchman who captivated and eloped with the young and beautiful Mrs. Anne Whiting Pryor, without waiting for the formalities of a divorce. The family was constantly on the move, but after the father's death in 1818 settled in Charleston, South Carolina, and here Frémont received his school and college training. He was a bright unsteady scholar, and a youthful love affair caused his dismissal from college.

Young Frémont had an engaging personality and succeeded in interesting a succession of important men in his welfare during his lifetime. The most important of these, however, was his father-in-law, Senator Thomas H. Benton of Missouri, in whom he had a powerful political ally and who secured for him the appointments that placed him at the head of important survey parties. And in Jessie Benton, Frémont had acquired a wife who throughout a long life was devoted and useful in advancing his plans.

He served in the Navy as an instructor in mathematics and made a three-year cruise in South American waters. Frémont then secured an appointment in the United States Topographical Corps. It was on a survey connected with this work that he got his first taste of travel in the wilderness. It was in connection with this work, also, that he met Jean Nicholas Nicollet, a first-rate scientist, surveyor and topographer. With Nicollet he spent a year surveying the courses of the Mississippi and Missouri and the region that lay between these two streams. He followed this up by spending a year surveying the course of the Des Moines River. This was his first independent exploration.

In 1842 Frémont at his own request was appointed to survey the frontier beyond the Missouri River and to extend his investigations westward to the Rocky Mountains and particularly to survey the pass which led through the mountains to the great region beyond, known as Oregon. In his party were 21 men, mostly Creoles and Canadian *voyageurs*. He was unusually fortunate in attaching to his party two men who were of great assistance to him in his subsequent work, Kit Carson and Charles Preuss. With this party Frémont succeeded in a very



FRÉMONT, 1838 1845

(1) Fremont and Nicollet on the Missouri and Mississippi, 1838 9 (2) Fremont on the Des Moines River, 1841 (3) Survey to South Pass on the Oregon Trail, 1842 (4) First circuit in the West, 1843 45 Only the earlier and more important of Fremont's travels are shown

short time in advancing up the Kansas River and then crossing over to the North Platte, which he followed into the Sweetwater and then into the mountains near the famous South Pass. He made a careful study of this region, traced out this part of the Continental Divide and ascended the highest of the Wind River Mountains, now known as Frémont's Peak. He mistakenly supposed that this was the highest peak in the Rocky Mountain system.

Frémont returned to Washington and rapidly completed his map and "Report." The latter attracted great popular interest, for the eyes of thousands of Americans were then directed eagerly to the West and anything that gave them information on the lines of travel into new territory was of vital importance. The interest that Lewis and Clark had initiated in the Northwest had continued and augmented. Trappers and hunters and traders had gradually penetrated the region. Interest had been stimulated also by the activities of a medical missionary, Marcus Whitman, who had gone out to Oregon territory and taught the Indians and been a leader in a small settlement near the present Walla Walla, Washington.

Whitman had made a hazardous winter crossing of the Rocky Mountains in 1842 and had arrived in Washington where his frontier appearance added a dramatic touch to his story. His journey was apparently prompted by some difficulties connected with his mission, but he was interested also in the political fate of the territory. At this time there was a considerable conflict in the region between American and Canadian fur companies, and the United States was trying to encourage occupation of the territory by pioneer settlers, so that its claim to the region might be strengthened.

In any event, the presence in Washington of Whitman and Frémont focused interest on Oregon and in 1843 there was a concerted movement of settlers for that territory. Whitman, returning to his settlement, guided a string of wagon-trains over the South Pass-Oregon route which Frémont had surveyed.

Frémont had no difficulty in securing a commission to continue and extend his explorations and surveys. The object of his expedition of 1843 was to connect the work he had done around South Pass with the survey work that Wilkes had succeeded in doing in 1841 on the Columbia River and in the Sacramento Valley in California. With 39 men traveling in 12 mule-drawn carts, Frémont set out from Kansas City. There was also a light covered wagon mounted on good springs which conveyed the instruments. His route west to the mountains lay to the south of the line he had previously followed. He sighted Pike's Peak on July 10th and then met Carson at Pueblo, Colorado. The country they had now reached was scarce of game and the party was supporting itself largely by hunting. This, combined with a lack of success in finding a way through the mountains, led them to a more northerly course. They followed the Black Mountains and around the Medicine Bow Mountains and finally arrived at the South Pass by way of the Sweetwater.

Frémont proceeded to Great Salt Lake and made a study of a portion of the lake. Later the publication of his report had a good deal to do with the selection of this spot by the Mormon colony, which was established in 1847. With the approach of winter and the lack of supplies, Frémont decided to diminish the size of his party and 11 men were sent back East. He then divided the remainder of his party so that he and a few men would be freed from dependence on the heavier baggage and would be enabled to travel more rapidly, while his assistant, Fitzpatrick, took charge of the heavier equipment. In this fashion Frémont succeeded in reaching the Dalles of the Columbia River early in November. Most of the expedition remained here while Frémont went on to Fort Vancouver.

He started his return journey at the end of November and ran into great hardships and difficulties. He had abandoned his vehicles but even the horses and mules with which they were traveling had difficulty in getting through the heavy snows. He selected as his route a passage through the Great Basin, bounded on the east by the Wasatch Mountains and on the west by the Sierra Nevada Mountains. Mid-December found them at Klamath Marsh and in January he was on the Carson River. The sad state into which the men and animals had now fallen and the difficulty of travel in the mountains suggested a descent to the California plains. He had great difficulty in finding a pass through the Sierras and was finally guided through by an Indian who had been among the white settlers in the Sacramento Valley. It was the early part of March before the expedition encamped at Sutter's Fort, on the site of present Sacramento.

At Sutter's Fort Frémont re-equipped his expedition and started on a return journey which led him southward up the San Joaquin Valley. He followed the edge of the Sierras until he hit the Spanish Trail that led from California to Santa Fé and followed this eastward.

It was along this trail that Frémont's expedition encountered disconsolate Mexicans who had been attacked by the Indians and had their horses stolen. Kit Carson and another western guide, Godey, volunteered to ride after the Indians and make an effort to recover the horses. This they did, following an Indian trail into the mountains. They discovered the Indian camp and, though they were greatly outnumbered, they attacked immediately. They put up a tremendous shout and fell on the Indian camp so suddenly and with such vigor that most of the Indians fled. Godey and Carson each captured an Indian and when the Indians were presumed to be dead, they proceeded to take their scalps. One of the Indians recovered consciousness and came most actively to life. He jumped up and began to make good his escape before he was brought down with another bullet. Within 30 hours of the time they had separated from Frémont, Carson and Godey were back with the scalps dangling from their guns. In this brief time they had ridden about 100 miles, had fought a band of Indians that greatly outnumbered them and had recovered some of the stolen horses and inflicted a severe punishment on the thieves!

Frémont's party reached Las Vegas (now in Nevada) in May; then they went to Utah Lake and diverged from the well-known trails to explore the Wasatch and Uinta mountains. On his way back he also examined the mountains above the sources of the North and South Platte rivers and arrived at Pueblo again in the middle of the summer.

Frémont again wrote a report that aroused great interest. He had carried out his instructions and had examined and described some of the most salient and interesting features of the great and little known West. These included the Rocky Mountain system, the Great Salt Lake, the Great Basin, the Sierras, the river valleys of California and the deserts of the Southwest.

Once again Frémont had been fortunate. He had worked on the Oregon Trail just before it had become one of the great highways of the country. Now he had examined the Mexican-California frontier when all political interest was centered there. He had seen how slight was the Mexican hold on California and no doubt he and Benton dreamed of a united West under control of the United States.

When Frémont started on his next expedition in 1845 the Mexican War was already brewing and the annexation of Texas had been determined upon. Again the chief interest of this expedition was to find the natural paths into the Pacific area. Immigration was increasing and the possibility that the United States might extend its control to the Pacific made the speedy discovery of transcontinental routes a matter of great moment and urgency. Officially Frémont was going out on a scientific and survey expedition, but there is more than a hint that suggests that he was more carefully armed than these circumstances required and that he was already privately prepared to play a part in military activities if circumstances arose that made this possible. This time Frémont divided his party and crossed the Great Basin by two different trails which united at Walker Lake at the foot of the Sierras. From here he crossed the mountains to Sutter's Fort while a division of his expedition worked into California around the southern end of the Sierras. The parties united at San José.

In 1846 he became involved in a series of disputes with the Mexican authorities in California. He finally gathered his men on Hawk's Peak in the Gabilan Mountains and here he built a fort. He refused to carry out orders sent him from the Mexican authorities and hoisted the American flag over the fort. This was the first time the American flag had been flown in California.

Then Frémont turned northward and was in the Cascade range when a messenger from the East reached him saying that his status was changed. He was to stop being a surveyor and regard himself instead as an officer of the American Army. At this moment Frémont's great work as an explorer and his important contributions to geography had already been made. From this time on he becomes increasingly involved in military and political life for which he had little aptitude and which interfered increasingly with his work as a traveler, for which he had such exceptional training and talent.

Frémont has been both praised and blamed for the part he subsequently played in the conquest of California. In any event he was sent to Washington under arrest to stand a court-martial on charges of mutiny, of disobedience and of conduct prejudicial to good order and discipline.

The court-martial found him guilty and President Polk approved the verdict, with the exception of the charges regarding mutiny. President Polk remitted the penalty and Frémont resigned from the Army.

Despite his conviction, or possibly because of it, Frémont came out of the trial with a good deal of popular sympathy, and there were many who felt he had been badly used.

In 1848 Frémont and Senator Benton out of their private resources organized a further exploring expedition whose object was to find a line for a railroad westward along the Rio Grande. This was part of an elaborate plan for a railroad system from the Atlantic to the Pacific. This expedition proved one of disaster. Frémont showed bad judgment in deciding to attempt a crossing of the mountains in mid-winter. On this trip he did not have the great assistance of Kit Carson. He had instead a guide named "Old Bill" Williams, who appears to have misled the party. Before they could extricate themselves from the Sangre de Cristo Mountains and reach the Rio Grande, most of the animals and 11 men of the expedition had perished of cold. The expedition was abandoned and the company dispersed. Frémont went on to California, and when he got there he found that gold had been discovered on Sutter's property.

Frémont made a last and least important expedition in 1853. The government at this time was interested in furthering transcontinental railroad surveys. Frémont was disappointed and annoyed at not being asked to head any of the parties. He organized a party of his own and attempted to carry forward the project he had been interested in in 1849. He added some information about mountain country in the Southwest.

He was in Europe when the Civil War began and on his own responsibility contracted for the purchase of arms and ammunition for the Federal forces. He was appointed a major-general in command of the department of the West, with headquarters at St. Louis, but managed matters so badly that Lincoln had to recall him. For a while he held a command in the Mountain Department of Virginia, Kentucky and Tennessee, but he was not successful as a military leader and before long resigned. After the war he served for a time as governor of the territory of Arizona. He was appointed a major-general by an act of Congress and the pension which he drew from this appointment as a retired officer helped him through his lean later years. He lived in California but died during a visit to New York in 1890.

Whatever his shortcomings as a military leader or civil officer, Frémont remains a great pioneer and surveyor. His is the name most intimately attached to the discovery and development of the great American West. Frémont had lived to see the region west of the Mississippi converted from a vast and unsettled wilderness into a unified country of many prosperous and growing states. Where once he walked on foot along Indian trails or rode on horseback over the prairies, trains ran from coast to coast and new cities grew up where in his youth Frémont had seen only Indian tepees.

OTHERS IN NORTH AMERICA: THE UNITED STATES

THE exploration of western America went with a rush. Before the first American transcontinental trip had been completed, trading parties were already moving into the region. John Colter left Lewis and Clark on their homeward trip and, without even returning to civilization, joined such a party to guide it up the Missouri. He probably took them as far as the Yellowstone Park. Before Colter got back he met Manuel Lisa who was outward bound on the Missouri.

Let us take another example. Jim Bridger, the great pioneer, hunter and trader, discovered Great Salt Lake in 1824. He was no doubt the first there but in the same year P. S. Ogden of the North-West Company rushed to the lake only to find that W. H. Ashley of the Rocky Mountain Fur Company had been there before him. In other words, three men reached the lake at about the same time and only a year later Jedidiah Smith used it as a starting point for an extensive trip through the Southwest.

John Jacob Astor established the Pacific Fur Company in 1811 and sent out men who helped to open up the Northwest. W. P. Hunt was one of these. He left St. Louis in 1811, skirted the northern slopes of the Black Hills and the Big Horn Mountains. He tried to navigate the Snake River and found it impossible. Instead he crossed the Blue Mountains to Walla Walla and came to Astoria in 1812. Astor's company also sent an expedition by sea to the mouth of the Columbia.

But trappers and traders were not the only explorers in the West. Major H. S. Long of the Army made an expedition in 1820 which added much to the exploration of this country. Edwin James of this party made the first ascent of Pike's Peak.

In 1832 the American ethnologist, H. R. Schoolcraft, and his associate, Lewis Cass, traveled in the Mississippi Valley region, carrying out ethnological as well as topographical and geological work. At about this same time Captain B. L. E. Bonneville and Joseph R. Walker traveled extensively in the Rocky Mountain and Pacific coast regions. Bonneville combined the interests of the scientific inquirer with those of the fur-trader and in 1835 prepared a map of the river systems of the West.

An unusual and thrilling piece of American exploration was commenced by Major John Wesley Powell in 1869. Powell was then working in the Southwest and started the systematic exploration of the Colorado River. At that time only small sections of the river were accurately known. The tremendous and intricate system of canyons had baffled and in a manner overawed travelers in this region. The known rapids and cataracts of the river were regarded as reason enough for believing that navigation upon it was impossible. But as though this were not enough of a handicap there were also stories current that in places the river disappeared into the walls of the canyons or that it dropped out of sight below ground, and that the explorers would be swept into hopeless abysses.

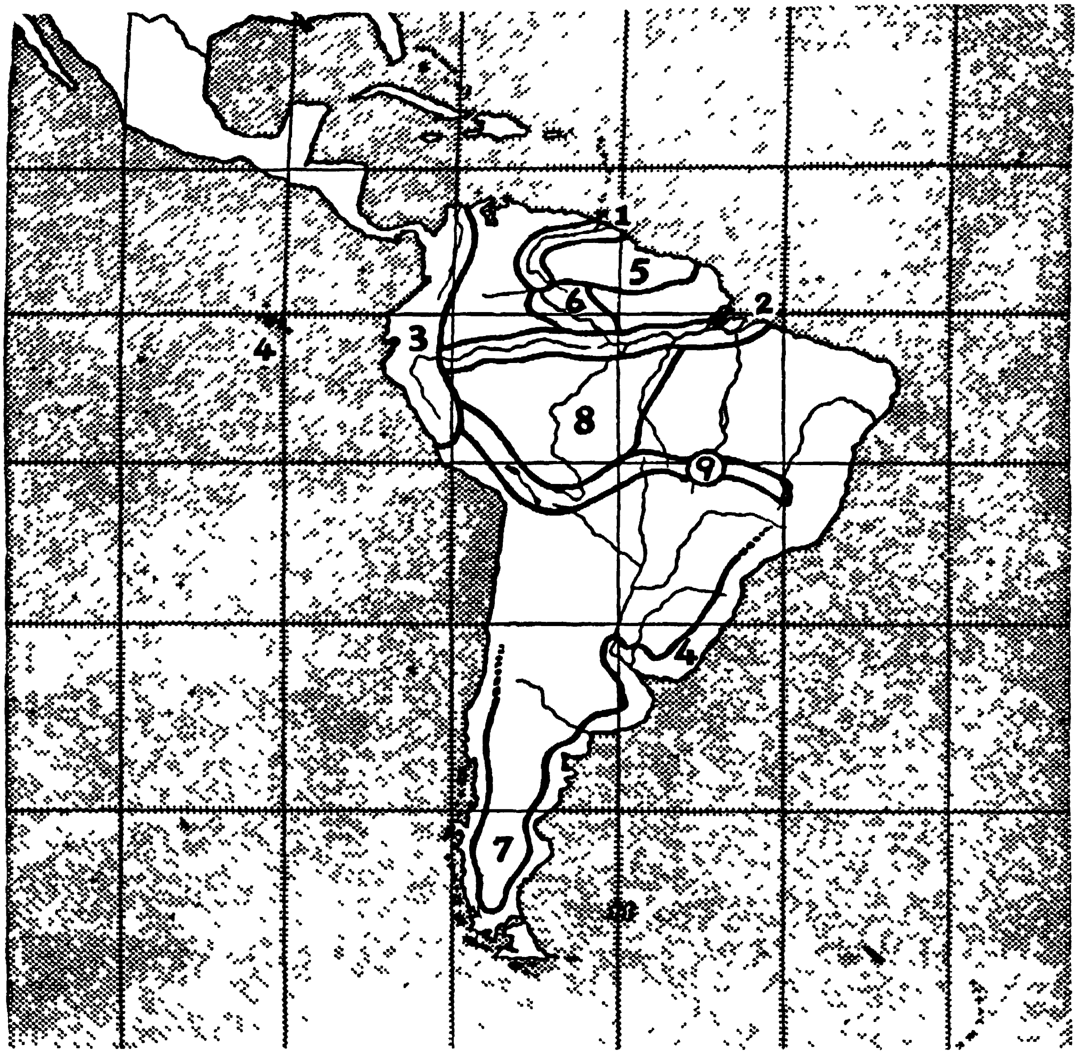
Even the task of reaching the level of the river at appropriate points involved many months of careful exploration. First Powell used four row-boats and made the passage from Green River station to the mouth of the Virgin River. This accounted for 1,000 miles of the river's course. In 1871 he again used four boats and passed through most of the sections of the Grand Canyon. The record of this extraordinary undertaking is preserved in Powell's report, *Exploration of the Colorado River of the West.* F. S. Dellenbaugh, who has traveled widely in the West and has written of the pioneers of the region and who is now a resident of New York City, was a member of Powell's expedition.

Major Powell's trip down the Colorado was certainly a daring performance but we would not do him justice if we conveyed the impression that he was simply an adventurer. The Colorado trip was only part of the survey of the Southwest. His work, carried out under the Smithsonian Institution, helped to stimulate the creation and organization of the United States Geological Survey and he later became the director of this organization. He also took an interest in the Indians, carried on anthropological studies and helped to organize the Bureau of Ethnology of the Smithsonian Institution.

Mr. Clyde Eddy and a party of young men have in the last few years repeated the passage of the Colorado. Eddy's undertakings have had about them more the air of glorious adventure than of exploration. But motion-pictures he has taken and his lively descriptions of his trip convey a very vivid sense of the extraordinary character of the river and of the difficulty that Powell and his pioneers encountered in carrying on their work.

PART V

SOUTH AMERICA



AREAS OF EXPLORATION IN SOUTH AMERICA AFTER 1550

(1) Raleigh on the lower Orinoco (2) Teixeira, Fritz, La Condamine, Bates, and Wallace traveled along the Amazon (3) Humboldt went up the Magdalena to Ecuador and Peru La Condamine also worked in Peru and Ecuador (4) Darwin worked around the coastline, also indicates his work in the Galapágos (5) Schomburgk in the Guianas (6) Rice on the northern tributaries of the Amazon (7) Musters in Patagonia (8) Chandless on the southern tributaries of the Amazon (9) Castelnau on the Amazon La Plata Divide

SOUTH AMERICA

BY 1550 South America was already known in all of its general features. All of the important rivers had been discovered and their courses followed at least once. The northern coast supported a number of Spanish colonies at Trinidad and the island of Margarita, in the region of Maracaibo, and at Cartagena. The Magdalena had been explored and colonies planted in the interior. Expeditions in search of El Dorado had entered the Orinoco and the other northern rivers. The Amazon had been followed from one of its sources to the mouth. In the La Plata region attempts at colonization had been made and the main ramifications of the stream explored. One of the crossings of the continent followed the tributaries of this river and established contact with Spaniards who came to the region about Potosi from the west coast. Magellan had passed between Patagonia and Tierra del Fuego and had named them both. There was a small strip of coast in the extreme southwest which had not been visited or at least was not well known. But from Panama southward to beyond Valdivia the west coast had been followed. At least one crossing had been made from Peru to the colonies up the Magdalena.

What remained then for subsequent explorers was to connect the known and settled areas with each other by new lines of travel. Another task that faced them was that of running traverses and lines of survey between the known points so that accurate maps might be produced. The early traveling had been hurriedly done and under desperate conditions. The peculiarities of South American geography have rendered the task of survey a long and arduous one. So, though parts of South America were early well known and though travelers have for centuries followed the great river systems which are the natural highways of the continent, yet it is only gradually and with the effort of many years that the details of South American geography have been recorded. Because rivers provide the best method of travel and because trails in tropical swamps and jungles are notoriously difficult, it has happened that men have often discovered and rediscovered the same river sections and each has believed himself the original discoverer. Often, also, genuine discoveries have been made and never properly reported.

Even today, though the mapping of South America is going forward vigorously, great territories are known only through the roughest kind of surveys and general descriptions. There are still areas lying between the great river systems which have not been seen and explored. There is still ample opportunity for the traveler, the surveyor and the cartographer to return with additional knowledge about some South American regions.

SIR WALTER RALEIGH (ABOUT 1552-1618)

FOR a period after 1550 there was a lull in South American exploration. The great burst of energy that sent forth the adventurers from Spain and Portugal and spread them over the continent had spent its first strength. Adventurers still came to South American shores, new Indian towns were captured, new Spanish towns founded; here and there men pushed into the mountains or the forests in search of new kingdoms or of gold. There was still hope of coming on some small but rich Indian civilization. But the sanguine and exuberant belief in a great country to be conquered overnight with a handful of warriors did not sway men's minds as it had in the previous half-century. The Spaniards had traveled too widely; they knew too much. The reports of discouragements, failures and disasters had been accumulating in Spain to balance the occasional successes. The men who were now going to South America went as colonists with more reasonable and temperate hopes.

But beyond Spain, among people less in touch with South America, there were still incurably romantic people who entertained the most lavish of dreams. In the bleak winter evenings at a country estate in Sherborne a middle-aged man bent over a table with Spanish and English volumes spread before him. The legs under the table were still lean and muscular. They were not extended, relaxed, but drawn up under the reader, the calves knotted. The head, thrust over the volumes, was alert with more than the scholar's interest, the eyes alight with more than abstract contemplation. The time would come when contemplation would be this man's solace but things had not yet come to that sorry pass. Here was hope, here was a line of action!

Raleigh married, Raleigh in private retirement, banished from the court, in disfavor with the Queen, still believed in El Dorado. Raleigh must believe. Time has flown on, a dull decade has fallen on England. This tame country-living while younger men with newer plans buzzed about the Queen was irksome, intolerable! But beyond the Spanish Main, beyond the seacoast, deep in Guiana lay the kingdom of El Dorado and Manoa, the golden city! Here it is; here is this wandering soldier, Ordaz, who has been there. Clearly, those who looked farther to the west for the treasure were deluded but this Ordaz had sought it all behind Guiana. And here were letters touching the journey that Don Gonzalo Jiminez de Quesada had made *eastward* after he had already found much gold in New Granada.

Raleigh wrote letters to the Queen and to those who still had the Queen's favor. He summoned his friends, he pawned, borrowed and begged; he flattered, cajoled and promised. A royal patent arrived—a patent authorizing him to "offend and enfeeble the King of Spain, and to discover and subdue heathen lands not in possession of any Christian prince, or inhabited by any Christian people, and to resist and expel any persons who should attempt to settle within 200 leagues of the place he fixed upon for the settlement."

In February of 1595 Raleigh sailed from Plymouth with five ships and some boats for river exploration. The fleet was scattered and he came to the shore of South America with only his own vessel and a small barque under command of Captain Cross. But he felt himself again a man of action, with a full panoply of brave aims and romantic ideas. He believed, or feigned to believe, that a voyage up the Orinoco would convey him straightway to El Dorado. So he hung about the entry between Trinidad and the mouths of the Orinoco. He came upon the pitch lake of Trinidad. Remarkable enough as a natural occurrence, Raleigh made it more marvelous still.

In March he went to Port au Spain and found his missing ships waiting for him there. He told the Spaniards he was on his way to his colonies in Virginia and they believed him and provided him with information and entertainment. Then he attacked and burned the city of San Joseph.

When he sailed, he carried off the governor, left his vessels anchored in the Gulf of Paria, off the western mouths of the Orinoco, and began pushing up the river. In this fashion they went, embarked, he says in an old

> "gallego, which I caused to be fashioned like a galley, and in one barge, two wherries and a ship's boat of the *Lion's Whelp* we carried 100 persons and their victuals for a month in the same, being all driven to lie in the rain and weather in the open air, in the burning sun, and upon hard boards, and to dress our meat, and to carry all manner of furniture in them, wherewith they were so pestered and unsavoury, that, what with victuals being most fish, with the wet clothes of so many men thrust together and the heat of the sun, I will undertake there was never any prison in England that could be found more unsavoury and loathsome. . . ."

The mouths of the Orinoco are so intricate that even in our own time they are imperfectly known. In this maze Raleigh and his ships blundered from stream to stream. Only a succession of fortunate encounters with local Indians and the providential theft of a load of cassava bread being taken to Spanish settlements saved the party and brought it at last into the stream of the Orinoco. Long before this the whole party had felt shut out from light and air by the gloomy forests that overhung the waterways, and the long battle with shoals and currents had worn down their strength.

Apparently Raleigh came into the Orinoco by the Manamo and finally anchored at the port of Morequito (San Miguel). He sent a party up the Caroní to look for a silver mine and he himself went as far as the falls of the river. Back again on the Orinoco, the ancient Indian, King Topiawari (He had to be a king!) cautioned Raleigh against attempting to reach El Dorado with so small a company of men. He also said that this was the wrong season of the year for a long journey. At least the latter statement was true, for the rains had come and the river was rising. Raleigh turned about and went rapidly down the river, apparently by the Macareo, an easier channel, and so along the coast to his ships. He had intended visiting his colonies in Roanoke, Virginia, but said he found the weather unfavorable. Instead, he visited some Venezuelan settlements, touched at the island of Cuba and sailed home.

He did not really come home empty-handed. In his vessel were many curiosities and relics and a pile of specimens of rocks and ores and crystals. They had no particular value, but they made a brave show. He wrote a report that made a brave show, too. It was called *The Discovery of the Beautiful Empire of Guiana, with a Relation of The Great and Golden City of Manoa . . . In the year 1595*. It is a wonderful amalgam of adventure story, imaginative travelogue, promoter's pamphlet and desperate man's hope, full of truth, lies, beauty and nonsense, all compounded by a master of prose and poetry.

In England everybody read *The Discovery of Guiana* and no one believed it. Believing in Raleigh was now out of fashion.

The Queen died and dour and grasping James I came to the throne. The great days were gone. Drake was gone, Frobisher, Grenville—not all friends to Raleigh but men of his stamp, men he knew and understood, even in rivalry. This James now . . . !

Raleigh did honor, bent the knee, flattered, but he no longer had a queen to deal with and James knew or suspected the thought that lay behind the courtesy. Though to the end Raleigh professed loyalty to the King, his estates were lopped off; rightly or wrongly he was charged with conspiracy and from 1603 on he found himself a prisoner in the Tower. In the arbitrary and unjust trial and in imprisonment Raleigh won more popularity and respect than he had ever achieved in honors and freedom. In the Tower he lived in ease as a gentleman might live at home, but it was a cramped prison still to a man who had harried the Spanish ships and sailed on the Orinoco.

Under penalty of death Raleigh yet sought the King with promises of wealth to be drawn from Guiana. Probably neither man respected or fully believed the other, but each wanted something the other might have it in his power to give. Raleigh wanted freedom at almost any price—freedom, not to avoid death but to court adventure—and the King was pinched and wanted money by the quickest route possible. Perhaps Raleigh could find it for him. There was nothing to lose, and if Raleigh failed he could always charge him with piracy and send him back to the Tower.

So Raleigh spent "the wreck of his fortune" on another voyage and in 1617 sailed back to Guiana on an ill-equipped, ill-considered venture. At Trinidad Raleigh was too ill with fever to move. Lawrence Kemys, his trusted captain, his own son Walter, and a nephew went up the river to find the fabled gold mine. They fought a desperate battle with the Spanish and Raleigh's son was killed and Kemys barely escaped with his life to bring the sad news back to the ship. Raleigh, old, enfeebled with fever and bitter with disappointment, stood up and gave Kemys such a tongue lashing that the captain committed suicide. In a state of disorganization and mutiny the ships returned to England and Raleigh to the dark Tower.

There was a kind of dignity about Raleigh that made his defeat and death more memorable than his triumphs; and a kind of vitality that went on stirring and troubling the world long after he had knelt by the block and thrust out his arms in irrevocable signal and spoken the low, encouraging words that recalled the headsman to his courage and his duty. Even in far-away South America, behind the Guiana coast, they remembered him—courageous, impatient, striding about full of the most romantic stories about some remote and fabulously wealthy kingdom and a strange, tragic people. He had left behind promises and a talisman of that people, made of shining cloth and of bright colors.

Over a century and a half later an English physician, Edward Bancroft, while roving in the Guianas, sent to his brother a letter dated "Rio Demerary, Oct. 25, 1766," published in 1769. In this letter he says:

> "The *Carribbee Indians* are at perpetual variance with the *Spaniards,* and frequently commit hostilities on their settlements at the River *Oronoque.* They retain a tradition of an *English* Chief, who many years since landed amongst them, and encouraged them to persevere in enmity to the *Spaniards,* promising to return and settle amongst them, and afford them assistance; and it is said that they still preserve an *English* Jack, which he left them, that they might distinguish his countrymen. This was undoubtedly Sir *Walter Raleigh,* who, in the year 1595, made a descent on the Coast of *Guiana,* in search of the fabulous Golden City of *Manoa del Dorado,* and conquered Fort *Joseph,* on the River *Oronoque.*"

FATHER SAMUEL FRITZ (1654-1724)

IN South America important explorations grew out of the long-standing hostility between the Spaniards and the Portuguese. The mythical boundary line between Spanish and Portuguese territory, which followed a meridian north and south and which had been set up by the bull of the Pope and the Treaty of Tordesillas, continued to be impractical and a source of the greatest uncertainty and rancor.

The explorer Pedro Teixeira became involved in these contentions. He, with a party of 1,500, the largest number of which were Indian men and women, had traveled in 47 canoes up the Amazon. He had reached the first Spanish settlement on the banks of the Payanimo and from here had proceeded to Quito on foot. Here, because of the jealousy of the Spanish, he had been ordered to return over the same route accompanied by two Spanish Jesuits who were to carry out surveys and make observations.

It was in 1639, when Teixeira was returning to Pará from his remarkable voyage up the river, that he took possession of a site in the name of Philip IV, King of Portugal, and set up a mark of delimitation between the Portuguese and Spanish domains. Neither the Spanish nor the Portuguese denied that he had performed the act of possession, and it is strange that nobody could identify the spot. Though the Act of Possession failed to settle the dispute, it gave the arguments and assumptions tangible form. The Portuguese claimed that the line of demarcation had been placed at the mouth of the Aguarico River, and the Spanish that it had been placed nearer the mouth of the Rio Negro, about 1,125 miles farther downstream.

The next explorer to become involved in these disputes was the Jesuit missionary, Samuel Fritz. After studying in his native land, Bohemia, with distinction he had decided to become a missionary and in 1686 had entered the college at Quito in Peru. Soon he had crossed the Andes and traveled along the upper waters of the Amazon until he came to the section of the river held by the Omaguas. Here he had set up a mission station, which he called San Joaquim. He traveled continuously along the river, visiting all the islands and shores held by this tribe. From the start his preaching and his care for Indian welfare was well received and he showed a singular aptitude for adapting himself to the difficulties of the tropical climate and the dangers of river travel. The river was a highway, and his fame soon passed beyond the limits of the tribe he had originally chosen to serve. At the invitation of the chiefs, he went down the river among the Jurimaguas, where he founded a mission and built a church, and then he passed still farther down the river among the Aysuares and Ybanomas.

For three years Father Fritz had carried on his work with great energy and great good-will, but no strength of resolution is an armor against the Amazonian climate, and in 1689 Father Fritz found himself seriously ill. The only medical assistance was at Pará, over 3,000 miles away. Fortunately on his passage downstream he received some care and preliminary treatment at a Portuguese mission station. By the time he had reached Pará, at the mouth of the Amazon, with a troop of Portuguese, he was very weak and ill, but after some months began to recover.

By this time he became involved in the inevitable bickerings and jealousies between the Spanish and the Portuguese. The Portuguese now charged him with being a spy sent by the Spaniards to investigate the Portuguese activities on the river. They also claimed that the missionary stations which Father Fritz had built were in Portuguese territory. They held him a prisoner for nearly two years, but at the end of this time word finally came from the Portuguese king that Father Fritz be released and escorted back to his mission.

In the summer of 1691 he started back upstream, passing in turn to both the mission stations he had founded. Despite the sickness he had undergone and the political difficulties in which he had become involved, he kept careful records of his routes up and down the river. He prepared a series of notes and a map, in which he embodied all that he had learned of the course of the river and its tributaries.

After a year he decided to make the journey to Peru. He had concluded that his mission stations were in Spanish territory and that the Portuguese were encroaching farther and farther up the river. Inasmuch as these advancing Portuguese parties were raiding the Indian tribes to secure slaves, he feared greatly the disruptive effect that they would have on his educational and religious work. The dispute again revolved around the question of where the boundary line between the national interest should be set.

In 1692 Father Fritz made the voyage up the tributaries of the Amazon, the Guallaga (Hualaga) and the Parapura to Cassamarca, Trujillo and Lima.

In Peru Father Fritz laid his discoveries and contentions before the authorities and in 1693 returned to his mission at San Joaquim, passing by the River Jaen and the defile of the Pongo, an arduous and dangerous passage. Of these routes Father Fritz kept as careful record as possible and added to his growing fund of geographical observations on the great river system.

For 10 years he continued his missionary activity without interruption and by this time had a large and growing system of missions planted in the valley. For another period of about 10 years, until 1713, he acted as superior of missionary work over this great area. Even this did not mark the end of his activities, for the years from 1714-1724 he spent extending the work among the Xeberos. Xeberos was Father Fritz's name for the Indians who are now usually spoken of as the Jeberos or Jivaros. These were the savage and widespread tribe that occupied territory along several of the upper streams of the Amazon. They built villages and were in some respects a fairly advanced tribe. They are, however, best known for the fact that they made frequent raids in distant villages of their own and other tribes and from the fact that they cut off the heads of their victims and then by a special technique, accompanied with elaborate ritual, prepared the face and scalp by shrinking. So careful was the practice developed that in the better prepared heads the characteristic expression of the individual is preserved, though the head itself in its final state is left only a little larger than a baseball. Such heads are to be seen in many ethnological museums and the technique has recently been studied by Professor Karsten and others.

Father Fritz's record is one of continuous devotion to service and of unusual accomplishment. He made important contributions both to religious work and geographic knowledge. He remains a pleasant and impressive example of the work which Catholic missionaries of various orders carried out in different sections of the South American continent.

CHARLES MARIE DE LA CONDAMINE

(1701-1774)

SOUTH AMERICAN exploration has been curiously linked with important developments in geographic science. The earliest of these developments were worked out by French mathematicians and geographers. In France in 1528 Jean Fernal tried to learn the length of a degree by measuring an arc of meridian. He measured the circumference of a carriage wheel and then counted the number of times that the wheel turned as the carriage was drawn between Paris and Amiens. Considering his time and the method employed he arrived at a very accurate result. The French Academy of Sciences was formed in 1666 and gave a great stimulus to scientific enterprises so that the French led in mathematical geography for many years. Jean Picard was one of those stimulated. In 1669 he also made measurement of an arc between Paris and Amiens. He however used astronomical methods. He used a quadrant attached to a telescope and fitted with cross-wires so that he had an instrument of relatively modern and effective form. Then a new aid to astronomical observation was provided by a Dutchman, Huygens, when he developed an accurate pendulum clock.

At this point South America comes into the picture, for Jean Richer, under the auspices of the French Academy of Sciences, went to the French colony at Cayenne to do astronomical work, carrying one of these clocks. He discovered that the pendulum which kept perfect time in Paris failed to do so in Cayenne, which is near the equator. The English mathematician, Isaac Newton, had already guessed that this would be the case. Newton had figured that, owing to centrifugal force, the curve of the earth would not be perfectly uniform. The earth would bulge at the equator and would be flattened at the poles. It became clear to the Academy that it was important to measure arcs in various parts of the world, both north and south and at the equator, to answer the questions that had been raised. Africa was still wild, savage and unknown and South America was the only large and accessible land mass in the southern hemisphere. The French sent expeditions to Lapland and to Peru to make new measurements of arc.

It was such an expedition that La Condamine led to Peru in 1736. Here he measured an arc of meridian and also studied the effects of latitude and change of altitude upon the pendulum. These measures showed, of course, that Newton was correct and that there was a flattening of the earth at the poles and an increase of circumference at the equator.

La Condamine had been born in Paris in 1701. He had started out on a military career and in the process of his education had been absorbed in scientific and geographic research. The scientific expedition in the Near East had given him some experience and had recommended him to the Academy of Sciences for the expedition in South America to measure the arc of the meridian. La Condamine's expedition was a large one, in which were represented the diversified talents necessary to a first-class undertaking. In M. Godin and M. Bouguer he had two associated scientists. He had also a physician, a surgeon, an engineer from the French Navy, a draftsman, a watch and instrument-maker to look after his scientific equipment; and in South America he was joined by two Spanish scientists.

This company proceeded to Peru. Here, on an elevated plain outside the city, he and his party carried out his projected object, the measurement of an arc of the meridian. This arc extended a little over 3° in length and a part of it lay north and a part south of the equator. The undertaking was a lengthy one and was carried out with all the precautions for scientific accuracy that were known at the time. Owing to supplementary scientific labors the expedition remained in this region for some 7 years. The party was not a very harmonious one, and it finally broke up, the various members of the expedition passing to diverse and mostly tragic fates. One of the younger members of the expedition died only three days after arriving in Quito; the surgeon was killed in a local riot; the draftsman had fallen from a scaffold while carrying out architectural work on a church, and there were many deaths and accidents among the lesser personnel of the expedition. La Condamine's scientific associate, Godin, and Madame Godin, later went through a series of travels so delayed and so difficult that they constitute a fantastic record of adventure.

None the less, geodetic measurements had been carried out by 1743 and La Condamine, separating from the rest of the party, determined to cross the Andes and to return by way of the Amazon River. Three lines of travel lay open to him: the first led by the River Napo, a route that had been followed by Orellana, Teixeira, Father Fritz and other missionaries; the second by Canelos and the River Pastaça (Pastaza) which had also been used by missionary workers. Because the first two were relatively well-known routes, La Condamine chose the third by Bracomoros and a pass in the mountains called the Pongo through which an upper branch of the Amazon flowed.

La Condamine left the Pacific coast from Tarqui, near Cuenca, and set out on his route, which was the longest and most difficult of the possible lines of travel. The road was little used and flooded because of the constant rains. In the mountainous districts it frequently led across the lofty and terrifying rope bridges which had been developed by the Incas and which were then still in common use. The upper waters of the tributary were navigated in tiny canoes and in improvised rafts. As soon as the river began to be navigable, a larger raft was constructed and all of La Condamine's goods and the records of his work were put aboard. It was launched in the stream and swept downward toward the town of Borja. But between the raft and Borja still lay the Pongo de Manseriché. Here the river runs between narrow and lofty mountainous walls, flowing at great speed, so that standing waves are raised in the mid-course of the stream and treacherous eddies are formed toward the shore. The members of La Condamine's party exhibited no interest, scientific or otherwise, in the treacherous waters of the Pongo, and they proceeded on foot while the scientist and a sole Negro slave were left to negotiate the passage.

Darkness came on them in the midst of the rapids and in the darkness the raft was swept onto an immense snag. A lopped off branch of one of the great jungle trees had been submerged in the river. The raft rushed upon this snag and was impaled. During the night the flooded tide of the river began to recede. The raft was held up out of the river and was about to dump all its contents and its two passengers off into the turbulent current. Eight years of continuous labor and research were in danger of being sunk in the river waters! By great good fortune La Condamine and the Negro managed to free the raft from the snag and went whirling down the river again. Several times the raft struck rocks in the course of that passage.

At last the force of the rapids abated and the raft drifted into quiet waters at Borja. Here the river expanded into a great and still inland sea with rivers and canals running amid the gloomy depths of the great, overshadowing tropical forest. The level plain of the waters stretched away for miles and miles on every side, blending at last in the distance with the level plain formed by the tops of the jungle trees. Only behind them, in the distance, were the hills of the Pongo to remind them of the great mountains through which they had passed. La Condamine said that below Borja they traveled for 400 leagues without seeing any sign of rocks or pebbles and scarcely any sign of solid earth. Indians, coming up the stream to Borja, were surprised to see rocks and went about filling their pouches with stones as though these were objects of unusual value.

At Laguna La Condamine carried out a series of astronomical observations and surveys and then he and Maldonado, the provincial governor, embarked in two large canoes, each over 40 feet in length, cut from a solid section of one of the forest trees. They were in a hurry to catch the vessels of the Portuguese missionaries which went annually down the lower reaches of the river, so they traveled both night and day while La Condamine was almost continually employed taking observations and sounding the depth of the river and observing his barometers to ascertain his elevation. They stopped at San Joaquim, the station which had been founded by Father Fritz, and then pushed on in great haste to reach the mouth of the Napo in time to make an observation on the immersion of the satellites of Jupiter. La Condamine was anxious to do this to throw some light on the long-debated question of the Portuguese and Spanish boundary and for this purpose had transported over the mountains and down the river a telescope 18 feet in length. He arrived in time to locate this river junction and to settle, to his own satisfaction at least, the question of the boundary dispute.

Among other curiosities that interested the scientists was the matter of the Amazons who had been reported by Orellana. La Condamine made inquiries among the Amazonian Indians and believed that there was evidence to establish the reality of the existence of the group of women warriors who lived apart in a region along the Rio Negro or some other northern tributary of the Amazon.

La Condamine went up a portion of the Rio Negro until he again saw evidence of hilly country. Here he made inquiries regarding the existence of the natural connection between the Orinoco and the Amazon basin. This was the so-called Cassiquiare Canal. As a result of his inquiries La Condamine felt certain that such a waterway existed, though to many of the cartographers of the time it seemed so unlikely an occurrence that they had eliminated it from their maps.

Four months after leaving the Pacific slope, La Condamine arrived at Pará where he was hospitably and comfortably entertained and officially received by the governor. Here he undertook through use of the pendulum to study the effects of gravity at sea level in order to compare them with a series of studies that he had made at great elevation in the mountains above Quito. Here also he made a number of canoe journeys at the mouth of the river in order that he might be able to complete his maps of the Amazon region.

La Condamine then left for Cayenne (French Guiana) in a large canoe driven by 22 oarsmen. Below Pará he crossed the Pará branch of the Amazon and coasted along the island of Maraja. Keeping along the coast he passed Macapá and Cape North and, after a two months' trip, arrived at Cayenne. Here he carried out a repetition of the pendulum experiments that had been initiated in the work of Richer. He had expected to have a ship at his disposal at this point and to return to France, but the vessel had not arrived and he was delayed five months. This represented a period of tedious and irksome waiting. The effect of the delay was accentuated by the fact that La Condamine had been without direct news from France for a period of over five years, and he was also at the time ill and depleted in strength. He was glad to accept the invitation of the governor of Dutch Guiana of a passage to Holland. Again, in a large canoe, he made the passage to Paramaribo and sailed from there to Amsterdam. He arrived in Paris in February, 1745, ten years after he had set out on his voyage. Here he published the results of his scientific work and an account of his travels, together with a map of the Amazon region.

He was the first trained scientist to travel extensively in South America and his works performed a permanent contribution, not only to geography but to general science as well.

BARON FRIEDRICH HEINRICH ALEXANDER VON HUMBOLDT (1769-1859)

IN the last months of the last year of the 18th century there arrived on the South American shore a man who added greatly to the scientific knowledge of this continent, who found in its varied natural situations unusual opportunities for research and who drew from it materials that became important for the whole history of the natural sciences. This was Alexander von Humboldt. Later, in publishing his works, he said:

> "I wished to make known the countries I had visited; and to collect such facts as are fitted to elucidate a science of which we as yet possess scarcely the outline, and which has been vaguely denominated Nat-

ural History of the World, Theory of the Earth, or Physical Geography. The last of these two objects seemed to me the most important."

He admitted that he hoped to find new species of plants or animals but said that such discoveries would seem to him less important than being able to throw light "on the geographical relations in the vegetable world, on the migrations of the social plants, and the limit of the height which their different tribes attain on the flanks of the Cordilleras."

When Humboldt landed at Cumana November 12, 1799, he was one of the most carefully trained observers and he led one of the best equipped expeditions that up to that time had entered the field of exploration anywhere. Humboldt was then only 30 years old but most of his life had been spent in a series of studies which equipped him for this undertaking. Even as a boy he had earned the title among his friends and family of "little apothecary" because of his interest in collecting and labeling plants, shells and insects. There had been some talk of his entering a political career but by his 20th year, when he entered Göttingen University, he already showed his interest in the natural sciences by publishing a paper on the basalts of the Rhine.

It was about this time that he met George Forster who had sailed with Captain Cook on his second voyage. This friendship greatly strengthened Humboldt's determination to become a scientist and explorer. In accordance with the custom of German education Humboldt traveled widely among the universities, going wherever he could find the best training in the studies that equipped him for his career: to Hamburg for commerce and foreign languages; to Professor Werner at Freiberg for geology; to Jena for studies in astronomy and the use of scientific instruments.

At Freiberg his researches led to the publication of a paper on the plant life of the mines of the region. These and similar studies were carried out as part of his work as assessor of mines and he soon rose to the head of this department; but already his interests had stretched beyond the strict field of science. He had met Schiller and Goethe and the other great men of his time who were part of the informal association at Weimar. He carried out some diplomatic errands and traveled in England, Austria, Switzerland and Italy.

In 1796 his mother died. Having now some resources at his command and being free of family responsibility, he commenced to travel. In Paris he associated himself with Aimé Bonpland, the botanist. It was part of his plan to travel to Egypt and there join Bonaparte. Humboldt and Bonpland went to Marseilles but there became diverted from their original intention and went to Spain. Here the interest and the assistance of the minister, d'Urquijo, turned their attention to the opportunities for exploration in Spanish America, so Humboldt found himself at last on the South American coast. Here he observed a remarkable meteoric shower, and this led him to make the first observation on the fact that this was a periodic phenomenon.

From Cumana Humboldt went to La Guayra and then to Caracas and from this point he planned his first extensive expedition which was to carry him into the little-known upper sections of the Orinoco River. In 1800 he traveled in a great arc through Venezuelan territory, passing first to the mountains of Los Teques, the region of the hot springs of Mariara, the banks of Lake Valencia and the great savannahs of Calabozo. He entered the Orinoco Valley by way of the Apure and arrived at San Fernando de Apure. Diego de Ordaz in 1531 had already traveled far up the Orinoco but Humboldt brought back the first surveys and scientific observations on this region. He was able also to study the curiously irresolved watershed between the Orinoco and

Amazon systems and to fix the position of the Cassiquiare, the natural waterway which connects these streams. This passage had been used by Spanish missionaries at least as early as 1744 and was probably known before that time but had never been carefully observed.

At the end of 1800 Humboldt left Venezuela and spent some time in the island of Cuba. He then reached South America again at Cartagena and made an ascent up the length of the Magdalena River. From the upper waters of this river he worked his way into the mountains and crossed the high Andes, reaching Quito in January, 1802. He spent considerable time in the mountain regions, investigating Antisana, Cotopaxi, Tunguragua and Chimborazo. He twice climbed to the summit of the great volcanic peak, Pichincha. Here he studied the way in which the boiling point of water is affected by altitude and also sampled the constitution of the air at high altitudes. Then he traveled through the country of some of the headstreams of the Amazon and crossed the mountains again to Lima in Peru. He crossed the Andes five times on this expedition. For some distance he followed and plotted the line of the magnetic equator. He passed through Cassamarca and Trujillo and observed the arid coast of Peru and arrived at last at Lima. In January of 1803 he sailed from Guayaquil to Acapulco in Mexico.

In Mexico he lingered a year, for he found it hospitable and congenial. His original plan had been to push on to Europe, for all his scientific equipment had seen hard and continuous use and stood in need of adjustment and repair. He passed from Mexico to Philadelphia for a brief visit and in August, 1804, he landed in Bordeaux. Humboldt brought back with him from South America a cargo of observations that were bulky in their proportions and revolutionary in their effect. Despite the long time that South America had been occupied and the amount of travel that had already taken place there, Europe was poorly informed as to the conditions and character of the country. His papers corrected many erroneous impressions of the continent and gave an accurate and systematic account of many of its important geographic features.

For a number of years Humboldt settled down to compiling and publishing his discoveries but his active travel was not altogether ended. In 1829, when he was 60 years old, with two scientific companions he made a rapid and remarkable crossing of Russia and Siberia as far as the Yenisei. This involved travel of nearly 10,000 miles, carried out in a period of only 25 weeks. The time was too short to permit the kind of diverse and yet detailed researches that he had been able to accomplish in South America, but it gave him some general observations and an acquaintance with new types of territory.

Humboldt had a great command of facts and an extraordinary power of scientific synthesis. He displayed powers of sympathy and comprehension so wide that he may be reckoned among our few universal geniuses. He was certainly one of the outstanding figures in science and philosophy in a century that was notable for its development in these fields. Out of the materials of his travel he fashioned concepts that are among the very foundation-stones of the modern sciences of physical geography and meteorology. The Spaniards had ravished the South American continent to bring back golden treasure and they had left in exchange a questionable economic system and a heritage of political struggles and discontents. But no one in all South America was the poorer for what Humboldt carried away with him. Yet from his spoils, his calm mind and inquiring spirit fashioned a treasure house for all men.

CHARLES DARWIN (1809-1882)

CHARLES DARWIN came to South America as a young man. He spent almost five continuous years traveling on the continent and sailing along its shores. We have seen already how much Humboldt obtained from South America. No less than Humboldt, Darwin derived a great bulk of his scientific materials from South America. The observations he made then and his reflections upon them went finally into the *Origin of Species*. So South America was an essential part of the training of two of the scientific giants of the 19th century.

Darwin was an official part of a British expedition sent out to explore and to make accurate surveys of Patagonia, Tierra del Fuego, the shores of Chile and Peru and the Pacific islands off the South American coast. The vessel in which the expedition traveled was H.M.S. "Beagle," a brig of 235 tons under the command of Captain Fitzroy. In the expedition Darwin held the post of naturalist.

Darwin nearly missed this trip which so greatly influenced his life and work. The son of a physician, he had received training in medicine but found he was not temperamentally suited for the profession. He had studied to become a clergyman but found that his interests were making a scientist of him instead. When the "Beagle" trip was proposed, Dr. Darwin said, "No," for to him it seemed a waste of time and energy. He said that if young Darwin could find even one "sensible man to approve of this voyage" he would reconsider the matter. Darwin had given up hope when he ran across his mother's brother, Josiah Wedgwood. To his great surprise Darwin found that the business man considered the trip "sensible." Dr. Darwin reconsidered. The appointment was made, and at the end of 1831, Darwin sailed on his long voyage.

The ship had hardly cleared the coast when Darwin discovered a great handicap. He was desperately seasick. He was seasick off and on for all the years he was aboard the "Beagle." Many men would have quit at once but Darwin bore it with patience and good humor and went on with his work whenever he could get his legs under him.

The ship skirted the African shore and touched at the Canary Islands and the Cape Verdes. While they were at sea, running several hundred miles off the African shore, they had a number of hazy days during which a fog seemed to hang about them and obscure the horizon. In the morning hours and the afternoon the sun appeared through the haze as a dull red ball. Quantities of fine dust fell on the deck and collected in the lay of the rope rigging. The event aroused Darwin's interest, though it was not an unfamiliar sight to seamen who knew these waters. Darwin collected samples of the dustfall, which he examined and sent back also to Europe for analysis. He studied records of similar events. He found that the particles of dust were skeletons and shells of tiny organisms that originated not in the sea but in fresh water and that some of these forms were found on the African continent. In other words, the ship was suffering from a sandstorm at sea, the sand being carried high in the air hundreds of miles to sea by the dry east wind, called the Harmattan, which blows across the deserts of Africa. Thus, from the first port that they touched, Darwin was able to send back to Europe his first scientific contribution.

In the Cape Verdes Darwin made his first study of tropical marine life and here he turned also to geology, preparing a report on the ancient volcanic activity in the island. On the run to South America the ship passed by the lonely and desolate St. Paul's Rocks and Fernando de Noronha, the peaks of submarine mountains thrust up out of the sea hundreds of miles off the South American coast. But this was all preliminary, a mere curtain-raiser.

The performance itself began when the ship came to anchor at Bahia in Brazil at the end of February, 1832. Here Darwin found nature on a grand, eye-filling, heart-warming, brain-tickling scale. Here the waters seethed with fish and other forms of tropic marine life; here the air was full of birds and the shore seemed almost to sink under the weight of vegetation. Here was a city with a wilderness at its back door. Darwin plunged into the sea and into the forest with a kind of feverish delight. He wrote in his journal:

> "Delight itself, however, is a weak term to express the feelings of a naturalist who, for the first time, had wandered by himself in a Brazilian forest. The elegance of the grasses, the novelty of the parasitical plants, the beauty of the flowers, the glossy green of the foliage, but above all the general luxuriance of the vegetation, filled me with admiration. A most paradoxical mixture of sound and silence pervades the shady parts of the wood. The noise from the insects is so loud that it may be heard even in a vessel anchored several hundred yards from the shore; yet within the recesses of the forest a universal silence appears to reign. To a person fond of natural history, such a day as this brings with it a deeper pleasure than he can ever hope to experience again."

His excitement soon wore off, but the interest and the quiet enjoyment never left him. He took most of the natural sciences for his province, devoting himself to geology, to botany or to marine zoölogy with equal interest and in accordance with the opportunities provided by the immediate locality in which he was working. This was characteristic of all Darwin's activity in South America. He was noting everything, carrying on a score of inquiries in different sciences at the same time. We remember him for his great work in comparative zoölogy and for his part in developing a theory of organic evolution, but he made important contributions to a number of other sciences as well. Two weeks in Bahia before the ship sailed seemed short indeed, but sufficed to give him some extensive collections from this region.

Even at sea, while the vessel was running down the coast, he got little rest, for he was tending nets slung from the stern of the vessel to catch the pelagic marine forms and was setting lines for large and small fish. The ship came to Rio de Janeiro, and Darwin made a long trip into the interior. Here he continued and amplified his studies, noting particularly the changes in the forms of life from those he had seen in the forest at Bahia. He studied the lianas or jungle vines and the part they play in the life history of the jungle trees. He began the study of the sensitive plants, a subject which continued to interest him. He studied the vampire bat and its sinister and aggressive yet silent and elusive ways. He found time to make the best collection of insects which up to that time had been gathered in this country.

In July, that is in mid-winter, the ship began moving south to take up its work in the region between the Plata and the Cape. This survey of the coasts was calculated to take two years and Darwin set up his post and headquarters at Maldonado. Here he met the Gauchos with whom he often traveled. He admired their daring, their skill in horsemanship, and liked their mode of life. Darwin kept a kind of log-book of all the animal forms he encountered and this proved of the greatest service to him when he came to develop and illustrate his later theories. During 1833 Darwin learned to know the region about Rio de Janeiro and about the Colorado River and also visited Bahia Blanca. When the ship sailed to the Plata, he left the "Beagle" and with a Gaucho as a companion rode from Bahia Blanca to Buenos Aires. From Buenos Aires he made a 300 mile journey to Santa Fé on the River Paraná. Here, across the river from the city, he discovered and explored rich beds of paleontological material.

In December he rejoined the "Beagle" and sailed to Patagonia. In her work the vessel passed from the east coast to Valparaiso in Chile and back again—so that in all Darwin sailed through the Strait of Magellan four times—and also visited the Falkland Islands. In the bleak plains of Patagonia Darwin had an opportunity to observe the meager or unusual forms of plant and animal life which contrasted sharply with the forms he had come on in the tropical jungle. Here also he studied the Patagonian natives and was led to some speculations on matters anthropological.

On the west coast of South America the vessel worked among the islands of the Chonos Archipelago. They were at Valdivia in February of 1835 where they had an opportunity to observe a great and devastating earthquake. The whole city of Concepción when they reached it was an unrecognizable ruin. The vessel was back in Valparaiso in March. Darwin again left the ship, proceeded to Santiago and from there crossed the Cordilleras by the Portillo Pass. He descended to Mendoza and returned by the Uspallata Pass. Crossing the mountains Darwin had an opportunity for geological study and also a chance to observe the occurrence of red snow. He picked up the vessel again at Copiapó, and sailed for Callao.

This was their last port on the South American mainland, but the ship touched at the Galápagos Archipelago and Darwin was able to set up camp at Chatham Island. Here, again, he was in a naturalist's and collector's paradise. The fact that made the most impression on Darwin was that the various islands, though they constituted one group, had each a different set of plant and animal inhabitants. Even the birds varied from one island to another. At the time of Darwin's visit the islands were little visited and the birds were so tame that they could be picked up in the hand.

From the Galápagos the "Beagle" made westward to sail around the world and so passes out of our story.

But the best part of the trip was over. Darwin did not again find the same richness of material nor the time for its collection. His work in South America led him to a number of observations: that plants and animals on islands were often closely related, yet not exactly the same; that in a particular area living animals, recently extinct animals and fossils were usually closely related but again not identical. Also, he was impressed by the gradations with which forms of animals and plants gave place one to another as he moved from the tropics southward to Patagonia. These things showed him the need for a dynamic theory that would explain the reason for and nature of the modification of species.

HENRY WALTER BATES (1825-1892) AND ALFRED RUSSEL WALLACE (1823-1913)

WHILE Darwin was voyaging in the "Beagle," an alert, energetic youth, Henry Bates, was growing up in Leicester in England. In accordance with his family's interests and traditions, he was supposed to be acquiring the foundations for a business career. Though he did well enough at his studies, his mind kept drifting outside the study-room and his afternoons and holidays were spent roving over the hills and along the streams of the countryside in search of botanical specimens. When he was 19 years old he met Alfred Russel Wallace, two years his senior, who had similar tastes and enthusiasms. It was W. H. Edwards's *A Voyage up the Amazon* which finally inspired them to explore South America. They were fascinated by the descriptions of the rich South American field and began plotting ways of reaching the Amazon together.

In 1848 they found passage on the "Mischief," a small trading barque headed for the South American coast. She was not a very impressive ship, but their passage money was little enough and this was all they could afford. They sailed on April 26th and two months later to the day picked up a pilot at Salinas to take the vessel to Pará. That year they made a trip up the River Tocantins and in the next year went up the Amazon to Santarem and Obydos and to Manáos, at the mouth of the Rio Negro. It had been a rich and profitable experience for both. But here they parted, Wallace to go up the Rio Negro to the Orinoco, and Bates to continue in the Amazon Valley.

Bates followed the stream for 370 miles until he came to Ega. Here he made headquarters for himself and continued his collection in this region for a full year.

In 1852 Bates returned to Pará but not to England. He had almost forgotten England. He knew how to get his body back to Pará, but his mind was as much caught up and fascinated by the Amazonian forests as though he were physically lost in its dark recesses. He quitted Pará and for three and a half years he made his headquarters at Santarem, from which point he made many trips, one of them taking him far up the Tapajos River. Then he went back to his old station at Ega for a four-year period. From here one of his trips carried him farther up the Amazon, and he had intended to reach the Andes on foot, but illness and failing strength turned him back and in 1859 he sailed home.

His travels and experiences he embodied in the book, *A Naturalist on the Amazons*. There is a delightful early edition of this work with the most striking and ludicrous contemporary drawings. Here Bates is pictured as a young man with long legs encased in tight-fitting trousers of large and glaring plaid design. He is complete with shirt and tie and with conventional shoes, as though out for a stroll in the English countryside. The figure runs through a series of drawings: Bates attacked by a mob of curl-crested toucans; Bates in a canoe being paddled by naked savages; Bates on the banks of a stream raising a club to dispatch a crocodile while a group of natives wrestle with it in the dark, turbulent waters of an Amazon backwater. And ever in the pictures appear the glaring and indestructible pants.

In contrast, our minds turn to the pictures of our neat, sensibly equipped young men who go out with tropical-weight clothes, stout high boots, proper headgear and compact food and medical supplies. They spend some months along the rivers and return to tell us all about the Amazon, exaggerating or underwriting their accounts, as suits the literary fashion of the moment. Yes, the old drawings make Bates seem a little amateurish and faintly amusing.

But somehow all this is forgotten when you turn to Bates's text. The clothes and mannerisms disappear and his adventures take on a timeless quality. There emerges instead the picture of a young, simple, enthusiastic mind confronted with the intricate and perplexing problems of an overwhelming nature, taking his adventures as they come because they are a part of an absorbing intellectual task. There is the man studying the way an army of ants ranges itself for an attack on a strip of forest; watching a spider attack and kill two finches (he reported a spider so large that Indian children tied a string around its middle and led it about the house like a dog); teaching the Indians about the conduction of electricity by linking hands with them and taking the shock from an electric ell; tending a sick Indian child; mourning the effects of Indian slavery; speculating on the future of mankind in the tropics.

Despite his many adventures, you can read through Bates without being overimpressed with his resolution and courage. They are there, for they must have been a part of his long voyages. But he is not conscious of them. He is conscious only of the fascination that keeps him moving from task to task because so much yet remains to be done. He cannot cease until it is accomplished. In his record Bates has conveyed not only his zest for knowledge, but this sense of the beauty and mystery of the forest. I think no book save Tomlinson's *The Sea and the Jungle* of our own day conveys so well the difficulties and delights, the dreamlike qualities and the realities of Amazonian travel.

When Bates returned to England he talked with Darwin and it was Darwin who encouraged him to the preparation and publication of his book.

Here is the passage in which Bates says farewell to South America:

> "On the evening of the third of June, I took a last view of the glorious forest for which I had so much love, and to explore which I had devoted so many years. The saddest hours I ever recollect to have spent were those of the succeeding night when, the mameluco pilot having left us free of the shoals and out of sight of land though within the mouth of the river at anchor waiting for the wind, I felt that the last link which connected me with the land of so many pleasing recollections was broken. . . .
>
> "The following day, having no wind, we drifted out of the mouth of the Pará with the current of fresh water that is poured from the mouth of the river, and in twenty-four hours advanced in this way seventy miles on our road. On the 6th of June, when in 7° 55′ N. lat. and 52° 30′ W. long., and therefore about 400 miles from the mouth of the main Amazons, we passed numerous patches of floating grass mingled with tree-trunks and withered foliage. Amongst these masses I espied many fruits of that peculiarly Amazonian tree the Ubussú palm; and this was the last I saw of the Great River."

When Wallace left Bates at the junction of the Rio Negro and the Amazon he turned up the Rio Negro and spent a month at Yavita on that stream.

> "The remainder of my South American travels consisted of two voyages up the Rio Negro. On the first I went beyond the boundaries of Brazil, and crossed by a road in the forest to one of the tributaries of the Orinoko. Returning thence I visited a village up a small branch of the Rio Negro, where there is an isolated rocky mountain . . . afterwards going up the Uaupés as far as the second cataract at Juaurité. I then returned with my collections to Barra, having determined to go much farther up the Uaupés in order to obtain, if possible, the white umbrella bird which I had been positively assured was found there; and also in the hopes of finding some new and better collecting ground near the Andes. These journeys were made, but the second was cut short by delays and the wet season. My health also had suffered so much by a succession of fevers and dysentery that I did not consider it prudent to stay longer in the country."

Wallace himself summarizes the striking and permanent impressions he derived from his South American travel:

> "Looking back over my four years' wanderings in the Amazon valley, there seem to me to be three great features which especially impressed me, and which fully equalled or even surpassed my expectations of them. The first was the virgin forest, everywhere grand, often beautiful and even sublime. Its wonderful variety with a more general uniformity never palled. Standing under one of its great buttressed trees—itself a marvel of nature—and looking carefully around, noting the various columnar trunks rising like lofty pillars, one soon perceives that hardly two of these are alike. . . .
>
> "The second feature, that I can never think of without delight, is the wonderful variety and exquisite beauty of the butterflies and birds, a variety and charm which grow upon one month after month and year after year, as ever new and beautiful, strange and even mysterious, forms are continually met with. Even now I can hardly recall them without a thrill of admiration and wonder.

"The third and most unexpected sensation of surprise and delight was my first meeting and living with a man in a state of nature—with absolute uncontaminated savages! This was on the Uaupés river, and the surprise of it was that I did not in the least expect to be so surprised. . . .

"But these true wild Indians of the Uaupés were at once seen to be something totally different. They had nothing that we call clothes; they had peculiar ornaments, tribal marks, etc.; they all carried weapons or tools of their own manufacture; they are living in a large house, many families together, quite unlike the hut of the tame Indians; but, more than all, their whole aspect and manner were different—they were all going about their own work or pleasure which had nothing to do with white men or their ways; they walked with the free step of the independent forest-dweller, and, except the few that were known to my companion, paid no attention whatever to us, mere strangers of an alien race. In every detail they were original and self-sustaining as are the wild animals of the forests, absolutely independent of civilization, and who could and did live their own lives in their own way, as they had done for countless generations before America was discovered. I could not have believed that there would be so much difference in the aspect of the same people in their native state and when living under European supervision. The true denizen of the Amazonian forests, like the forest itself, is unique and not to be forgotten."

Wallace returned to England and after a little over a year went on a lengthy exploring and collecting trip in the Malay Archipelago, from which he returned with a set of ideas which contributed in an important way to the rapidly developing theory of evolution.

DR. A. HAMILTON RICE (1875-)

RECENT exploration in South America is well represented by the work of Dr. A. Hamilton Rice, who since the turn of the century, save when interrupted by the War, has been carrying on an extensive series of exploration among the northern tributaries of the Amazon. Dr. Rice is a native of Boston and a Harvard graduate. After receiving his medical degree, he turned his attention to tropical medicine and commenced his voyages with a trip from Quito across the Andes and into the Amazon by way of the Napo. He followed this in 1907 with a survey of the Uaupés River, a tributary of the Rio Negro. In 1912-1913 he went back into the northwestern Amazon region, going to it from Bogotá across the Andes to Villavicencio and the Ariari River. On this expedition he turned his attention to the Içana and the Inirida and adjacent territory.

Dr. Rice started on an extensive topographic expedition in 1917 with the intent of surveying and mapping the Rio Negro. It was on this trip that he made his first experiments with the use of portable wireless telegraph instruments.

In 1919 and 1920 Dr. Rice extended his surveys in the Rio Negro region, passing this time to an examination of the Cassiquiare and a part of the Orinoco system. His most extensive exploration, however, was carried out in 1924-1925. This time he traveled by the Rio Branco and the Uraricuera. It was his intention to follow the latter stream over its lengthy course into the region of the Serra Parima and thence to force a passage to the upper Orinoco.

This expedition was an extensive one and well-equipped. It made use of recent scientific developments that seemed likely to prove of assistance to the explorer. A hydroplane was taken along to assist in reconnaissance and photography and in maintaining contact between parts of the expedition. Further experiments were made with the use of wireless sending and receiving apparatus and a novel method of astronomical survey was tested.

In addition to adding topographic surveys of great extent to the known sections of the Amazon region, Dr. Rice's work has been of great service in showing the utility and the limitations of the modern devices which he was the first to use in these regions.

The Shippee-Johnson Expedition

DR. RICE'S pioneer use of the airplane in South American travel has been followed by a number of expeditions that have used airplanes with considerable success. Perhaps the most interesting and effective use of the airplane in South American exploration was that of the Shippee-Johnson expedition to Peru in 1930, carried out with the endorsement of the American Geographical Society. Robert Shippee and George R. Johnson took several airplanes to Peru and carried out very extensive photographic surveys. Johnson, as chief photographer of the Peruvian naval forces during 1928 and 1929, had already made a series of aerial photographs of Peru, later published in his *Peru from the Air*.

The work of the Shippee-Johnson expedition demonstrated the utility of the airplane, not only for general mapping and topographical work but also as a method of studying the chief archæological features of a country. The photographs of this expedition revealed a number of hitherto undiscovered, ancient Indian sites. It was also through aerial reconnaissance that Lieutenant Shippee first discovered the lengthy Indian wall, the "Great Wall of Peru" which was later traced by the expedition on foot and by airplane from its beginning near the seacoast town of Chimbote for 40 miles through the coastal mountains until it disappeared into the mountains.

Others in South America

FELIX DE AZARA, a Spanish army officer, was among those appointed to a survey commission in 1781 which was to set the limits of Portuguese and Spanish territory. He had been well educated, had seen years of service in the army, including an Algerian campaign in which he was wounded, and had been made a brigadier-general.

Azara went out to South America immediately, but the work of starting the boundary survey was delayed for some time. He occupied himself in the meantime in extensive travel along the Paraguay and Paraná river system. He carried out extensive survey work and also studied the birds and animals of the region. He was one of the most important Spanish explorers and scientific workers in South America.

SIR ROBERT HERMANN SCHOMBURGK, the great explorer and naturalist, made known the hinterland back of the Guiana and part of the Venezuelan coast. In 1835 he ascended the Rupununy (Rupununi) tributary of the Essequibo, visited Lake Amicu and then proceeded into the Parima Mountains and ascended them to the highest ridge. He later discovered Smyth's River, explored the Corentyn River, and on one of the country streams discovered the giant water flower, the Victoria Regia lily.

In 1837 he again started up the Rupununy, went up one of its tributaries, the Rewa, and from the upper course of this stream went overland to the Essequibo. After exploring the Canuku Mountains and the neighboring territory, he commenced a long and wearisome journey from Lake Amicu through most difficult country, which finally carried him to Esmeralda on the Orinoco. From there his travels carried him through the Orinoco, the Cassiquiare and down the Rio Negro. Then he went up the Rio Branco as far as Fort San Joaquim. Later he returned to England.

In 1841 Schomburgk was again in Guiana, this time accompanied by his brother, to fix a provisional boundary between British Guiana and Venezuela, which eventually resulted in the establishment of the so-called "Schomburgk Line." His travels took him up the Cotinga River to the region about Mt. Roraima and along the Brazilian frontier, along which he made a boundary survey.

An energetic, systematic and indefatigable collector and observer, he ranks as one of the great scientific explorers in South America.

COUNT FRANCIS DE CASTELNAU traveled in South America between 1843 and 1847. During these years he led a French expedition which made two important crossings of South America.

He entered the country by Rio de Janeiro, went up the La Plata system and so into the interior of Brazil. He spent some time in an effort to trace out the watershed between the Amazon tributaries and the tributaries of the Plata. He went to Cuyabá and worked out the sources of the Paraguay, and crossed the Gran Chaco to Bolivia, passing by Potosí and Lima. In 1846 he started across the continent eastward from Cuzco, traveling by way of the Urabamba, the Ucayali, and the Amazon. He entrusted his records to Viscount d'Osery, a member of his party, and during the trip d'Osery was murdered and all the astronomical and meteorological records were lost. Despite this catastrophe Castelnau's long travels added a great deal to geographical knowledge.

WILLIAM CHANDLESS, in 1864-1865, made an important contribution to South American exploration. He went to the mouth of the River Purús, an important southern tributary of the Amazon which was then unsurveyed and very little known. He followed and mapped the course of this stream for a distance of 1,866 miles. Practically this entire distance he was traveling through the territory of suspicious and hostile native tribes. He survived the trip but while returning down the river his personal servant and the crew of his boat were set upon and murdered. During the trip Chandless had made a long march through the forest in an effort to pass from the River Purús to the Madre de Dios.

He also surveyed the Tapajos and in 1867 covered over 1,000 miles of the Juruá. His combined travels added more precise information about a great section of the Amazon Valley and led to many additions and modifications of the map.

GEORGE CHAWORTH MUSTERS was fascinated by the Patagonian giants. The Patagonian giants had always fascinated European travelers from the time they were first discovered by Magellan and described by Pigafetta. For centuries travelers who touched on the Patagonian shores in their effort to get through the Strait of Magellan or to round the Horn gave varying descriptions of this people. Some of these accounts were greatly exaggerated but under the extraordinary circumstances—the bleak, bare country, the uncouth clothing of the natives and the comparison with the Portuguese and Spanish who are not tall people—Pigafetta's reference to giants was not altogether misleading. He said, "The least, taller than the tallest men in Castile." Drake had touched at Patagonia in 1578 and reported them "Not taller than some Englishmen." It was Schouten, the Dutchman, who really let his imagination go. He said, "Human skeletons 10 or 11 feet long," and Darwin and Fitzroy in 1833 referred to them as "Tallest average of any people; average height 6 feet, some taller and a few shorter."

Musters, a retired naval officer, was in the Falkland Islands in 1869-1870 when, aroused by stories of the Patagonian life and character, he decided on an expedition. He proceeded to Punta Arenas on the Strait of Magellan. From this point he proceeded northward and then to Santa Cruz, and followed the Rio Chico nearly to its source. For the most part he kept well to the westward, skirting the base of the southern section of the Andes, and toward the northern end of his route crossed the plains to the Rio Negro.

Musters gave a general description of the country and added a good deal to our knowledge about the Patagonians, properly speaking the Tehuelches, pointing out the difference between their characteristics and methods of life and those of the Fuegians to the south and the Auricanians to the north and west. He lived a rough life traveling with the Indians and was not able to carry out accurate topographical work, but he left a description of the topography of the country through which he passed, a great deal of which up to that time was unknown.

JULES-NICOLAS CREVAUX, who traveled in South America a decade after Chandless, turned his attention to territories lying both north and south of the Amazon.

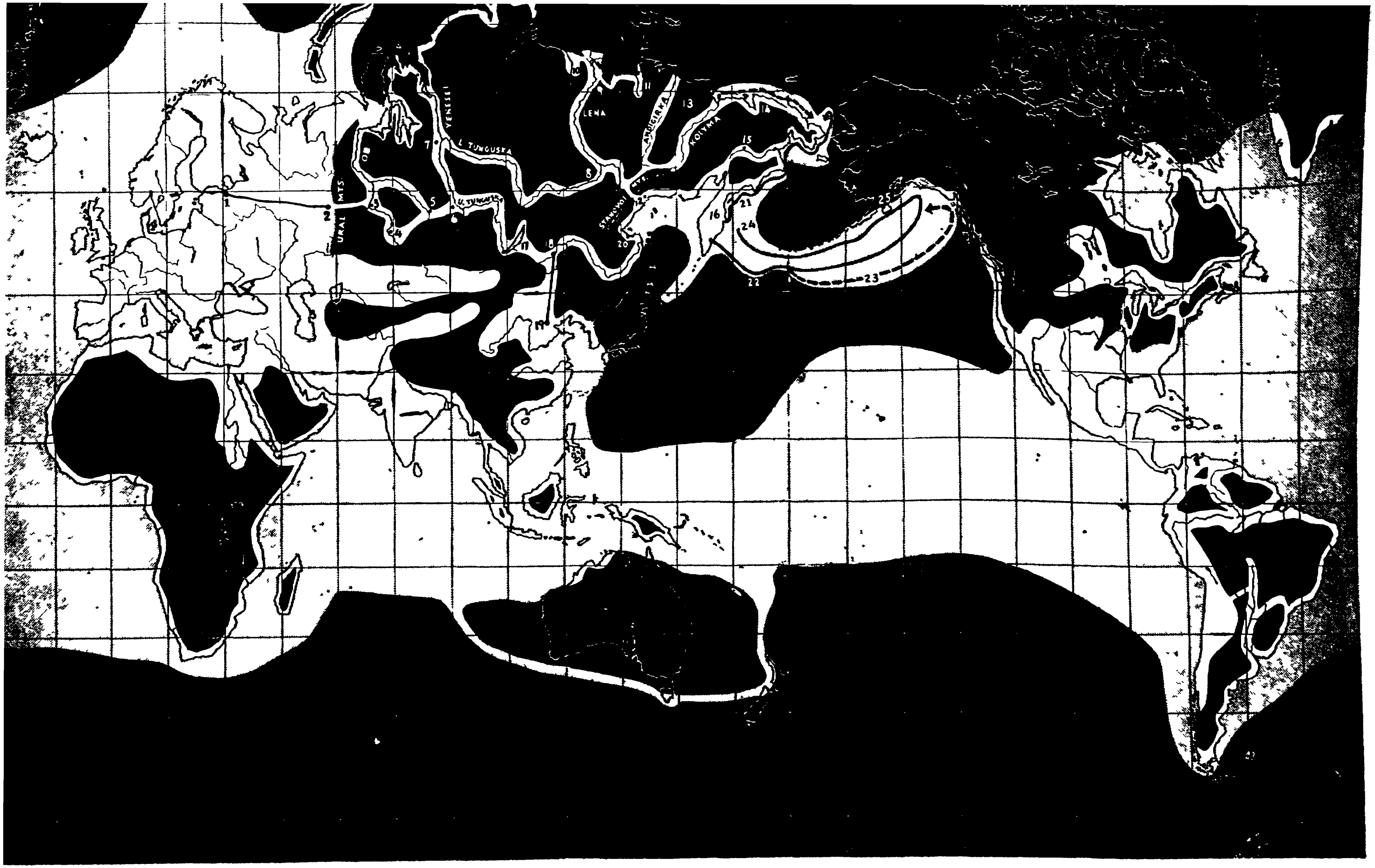
He came from the Lorraine and served as a physician during the French and German war of 1870. The succeeding year he was appointed a surgeon in the navy.

In 1876 and 1877 he began his explorations. He traveled in the interior of Guiana, exploring the Maroni, entering the country from Cayenne. He then crossed the Tumachumac Mountains and descended the Jary (Yari) to the Amazon. Thus he connected the surveys of the Guiana region with those of the Amazon Valley. The next year he started again from Cayenne and this time turned southward and westward. He reached the Iça or Putumayo branch of the Amazon and followed this and the Yapura to the Andes. The succeeding year was spent in a trip across New Granada (Colombia) and Venezuela. Here he was following the combined track of Federmann and Quesada. He passed down the Magdalena River into the Guaviare and then into the Orinoco system.

He returned to France for a brief period and then sailed to Buenos Aires, having it in mind to repeat in this section of the continent a network of surveys similar to those he had thrown across the northern part of the continent. It was his intention to follow the Paraná and to work out the relation of that watershed to the Amazon system. He found he had arrived at a poor season for exploring the interior of Brazil. He determined therefore to follow the Pilcomayo and to visit the tribes in the Gran Chaco region. This was in 1882. He had however proceeded only a short way with this plan when the tribe of the Toba turned upon him. He and 18 members of his company were massacred. Two Bolivians who had been attached to his party were captured but later escaped and brought back an account of the tragedy. The Geographical Society of Paris issued an atlas of the rivers of South America in honor of Crevaux, a considerable part of this atlas being based on his researches.

PART VI

ASIA



THE MARCH ACROSS SIBERIA: VITUS BERING

1. Petrograd
2. Perm
3. Tobólsk, 1587
4. Omsk
5. Tomsk, 1604
6. Yeniseisk, 1619
7. Turukhansk
8. Yakutsk, 1632
9. Mouth of the Lena—Busa, 1617
10. Olenek—Busa, 1617
11. Yana—Busa, 1618
12. Okhotsk Sea, 1638
13. Andigirka and Kolyma, 1644
14. Deshnev around East Peninsula (?), 1648
15. Anadirsk
16. Atlassof, Kamchatka, 1697
17 Lake Baikal
18. Nerchinsk on the Shilka
19 Spafarik to Peking, 1676
20. Poyarkov to mouth of the Amur, 1646
21. Bering, 1728
22. Bering, 1741
23 Chirikov, 1741
24. Bering dies, Bering Island
25. Glohof—Station on Kodiak Island, 1762

THE ADVANCE ON ASIA

THE discovery of the Orient by the peoples of Europe and the changes in living and in thought which the two independent systems of culture have produced, each upon the other, constitute one of the most far-reaching and important dramas in human history. With that great drama and struggle we are not directly concerned. But our story follows the travelers who were the prologue to the drama and the explorers who were the scouts of the engagement—daring and diverse characters but sometimes quite trivial ones playing an unconscious part in a great action.

It is curious that the culture of the West, centering around the Mediterranean, and the culture of the East, with centers in China and India and southeastern Asia, should have gone on century by century each following its independent developments without becoming conscious of the other until the 16th century. Please observe that this is different from saying that the East and the West had no influence at all upon each other. Studies of racial movement, of language, of mythology and ways of living all show that influences came out of Asia into Europe and that some passed also in the other direction. But these were slow and massive changes taking place over centuries and thousands of years. Many were probably painless and unconscious changes like breathing and digesting in the individual. The awareness of Asia, the desire to reach it that came in the 16th century was conscious, alert, sudden, like the challenge to a race or the call to battle.

It is true that in classic times wealthy Romans and Greeks received silk from China and that occasionally traders passed overland and also went by sea to ports in India and China. It is true also that Alexander made his brief invasion of India. But these were ephemeral and short-lived contacts and when the Dark Ages came they were forgotten. It is true that Carpini and Rubruck made their spectacular dashes to the barbaric court at Karakorum and that Marco Polo may be said to have seen and experienced the quality of Oriental life. But there had been no uninterrupted flow of goods or intercourse of thought until men in considerable numbers in the 16th century began making regular voyages between the East and the West.

At first they came in small numbers and then a remarkable and sweeping change took place in European activity. It was as though an idea about the Orient which the West had been incubating for a long time had come to life and hatched out, as though a shell restraining a liquid under pressure had suddenly sprung a number of leaks. The West and East, which so long had lain side by side like oil and water, now began to run together. From Europe streams of adventurers began flowing out in all directions. No wav was too long, no route was too improbable, whether it led east or west, around the Antarctic capes or the frozen shores of the Arctic or even over the Pole itself, so only it led at last to Japan or China or the East Indies. It was this flood of adventurers striving to reach the East that swept along the shores of all the hitherto unknown continents. And it has continued from that time to this, so that it seems not improbable that the focus of human interest in the next few hundred years will center on the Pacific basin as in past centuries it has centered on the Mediterranean and the Atlantic.

To some it may seem that this story of exploration has revolved too much about this pivotal search of the West for the East. Yet the idea is difficult to escape. The more we read of our adventurers, the more it becomes apparent that some easy route of reaching Asia was the ultimate goal, if not the immediate purpose, of all the developments in the great age of exploration.

Even after the initial contacts with Asia had been achieved, the idea continued to grow and to hold living force. Of course in the 15th and 16th centuries, there came a time when exploration in the New World became an object in itself. But as soon as the new countries were established they in turn heard the call of the Orient. Mexico and South America began sending sailing ships to the Philippines and the Indies. When the United States was young, it had an era when it turned with great eagerness to the East. The early full-bodied cargo carriers and the later lean clipper-ships were called forth by this desire. Many a hawthorn jar and pewter tea-caddy on New England mantelpieces still stand as testimony to the strength of this movement. America even played a crucial part in revealing one Oriental empire to the world. At the beginning of the 19th century Japan was practically unknown to all Europeans and it was a naval officer from New England, Captain M. C. Perry, who in 1853 established the first important and permanent trade-relations with the island of Cipangu that had been the dream of Columbus.

Once the bonds were loosed, the passage of travelers into Asia was very rapid. Adventurous vagabonds and men in search of trade penetrated remote regions long before we should expect to find them there. This rapid expansion reached even to Tibet and Central Asia. It was not scientific in character, and it provided only adventure stories, general descriptions and rough geographic ideas. This kind of travel ran through the 16th and 17th centuries. Then, in the 18th century, there arrived a time when travel in Asia slackened, or at least was attended with more difficulty and danger. This seems to be related to the fact that the European nations then had a firm and aggressive foothold on the coastal portions of Asia. There were English commercial power and political control in India, the Dutch island-empire growing in the East Indies, and various nations seeking a foothold in China. As the Oriental nations became acquainted with European commercial methods, with European military aggression and political rule, it tended to resist the advance of the travelers and explorers. And, though the missionary travelers always held a certain advantage of position, the Oriental people gradually extended their resistance to this group also.

The free, informal, wide-ranging traveler in Asia gave place to the better trained, better equipped scientific explorer with definite objectives. During the 18th century European military and naval strength was building up rapidly and the size and speed of vessels were increasing also. Scientific exploration in Asia may be said to begin at the end of the 18th and the beginning of the 19th century. An accurate knowledge of geography became important to European traders, military leaders and civil governors.

With the Industrial Revolution taking place in Europe the race for foreign markets in the Orient speeded up until it developed into a headlong and breathless sprint which has gone on to our own day. There is a very real but a not very apparent connection between the introduction of machine spinning in Yorkshire and Lancashire towns and the adventurous scientists who pushed their way up Burmese rivers and threaded jungle-covered mountain paths, who worked their way up the great Chinese river-valleys and spread out to follow the desert caravan routes across Central Asia. Often the explorer who had thought himself only a knight-errant marching under the banner of science has found himself instead a scout for an advancing economic imperialism.

The later scientific exploration of Asia differed from the exploits of the early travelers in that it fell into a more definite form. By the beginning of the 19th century a ring of countries under European control and centers of European influence had grown up around the coasts of Asia. The development of exploration in these various centers aided the later work of the explorers in Central Asia by cutting down the distance they had to travel from some reasonably safe base of operation. From this ring of centers the later explorers advanced, extending the area of known and mapped territory inward until finally the adventurous explorers of the 19th century put a network of routes through the great mountains, the steppes, and the deserts of Central Asia.

Our story will be shaped by these events. We will follow first some of the early adventurers who ranged widely in Asia, taking them to the point where the first contacts were established between Europeans in India and China and in China and Siberia. We will then follow rapidly the development of exploration from the various centers on the outward rim of the continent and finally close in on Tibet and Inner Asia. After sweeping rapidly around the coasts of Asia and following a few of the adventurers who wandered into the deserts and crossed the snowy passes of the world's greatest mountain ranges, we shall pass to Arabia, which lies off the beaten track and whose inner recesses have remained unpenetrated till the last few years.

Before 1450 Carpini and Rubruck and Marco Polo had traversed the important land-routes across Asia; Schilbterger and Clavijo had seen something of the western portion of Asia; and the missionaries had also reached China, both by land and sea.

Then came the period when land travel was interrupted by the growth of the Ottoman Empire. It was during this period that the Portuguese were making valiant efforts to reach India by traveling around Africa which met with their first success in the voyage of Da Gama in 1497. At almost the same time overland travel to the East was also established.

Da Gama, with his fleet, had swept up the east coast of Africa in 1497 and had come to the west coast of India. On this voyage he visited the city of Calicut. The Portuguese ships that followed him ranged further, coming to Diu and Goa and soon extending their route in the south to Ceylon. An unusually daring and independent traveler came with the ships that followed Da Gama around the Cape to India. This was Duarte Barbosa.

Barbosa had participated in the savage fighting and raiding which the Portuguese showered on the coasts of India, but when most of his comrades sailed back with the Portuguese ships, he remained. He traveled widely, collected information on many of the ports of India and Malaysia and on many countries which he was unable to visit. It is somewhat difficult to know exactly his routes in the East. Of Ceylon and parts of India he wrote at first-hand; he may have visited Pegu, and he was certainly at Malacca and other Malay ports. At the Malacca battle in 1511 and elsewhere in the East he met Magellan, and when they returned to Spain, Magellan married Barbosa's sister. He later accompanied Magellan, as an officer, on his voyage around the world, and a few days after the great Captain's death, Barbosa was shamefully deserted by the ships when he lay wounded and in dire extremity on the beach at Cebu. His *The Book of Duarte Barbosa* was one of the earliest guides to travel in the further Indian and Malay ports.

In speaking of Magellan and Barbosa we may recall also their comrade, Francisco Serrano, who went to the Moluccas to serve the local Prince of Ternate and who spent the remainder of his life there. He shows us vividly how rapidly the Portuguese spread in the East.

Pedro Teixeira (not to be confused with the Pedro Teixeira in South America), who was in Persia in about 1588, also went to Borneo and to Manila and then sailed across the Pacific Ocean to Mexico.

But the early travelers did not all follow the sea route that Da Gama had established. Within the first decade after Da Gama, a traveler reached India by an overland route. This was the Italian adventurer, Ludovico di Varthema. He started for the East in 1502 and then began one of the most extensive journeys on record. Whatever he may have been when he started out from Europe, in the East he became by necessity a good deal of a vagabond and hanger-on. An indefatigable and adventurous traveler, he went to Egypt, saw the great cities of Cairo and Alexandria and then worked his way through the Near East, stopping at Beirut, Aleppo and Damascus. Here he attached himself to a caravan and traveled with it to Medina and Mecca, the sacred cities of Islam. Later he went to Jedda, which serves these cities as a port on the Red Sea, and from here embarked on a ship which touched at Aden. He had almost escaped from Arabia when he was arrested. None the less, instead of leaving the country at once, he carried out some further travel in Arabia.

Then he took ship, touched at a port in Africa and came to Diu in India. Sailing west again, he came to Ormuz in Persia. In his travels in Persia he gives us one of our first descriptions of that country, though his route was probably not as extensive as it was at one time supposed. Returning to India, he visited a number of ports on the west coast and also the Coromandel Coast (on the east coast of India), Ceylon and the East Indies, passing even beyond Java. From India he sailed in the ships of the Portuguese and by 1510 had already published a fascinating record of his travels in which imaginative story-telling only occasionally interferes with the true record of his adventures.

Of course, the Portuguese and the Spaniards did not long have the Eastern lands and seas to themselves. The journey of Mendez Pinto, who traveled in the East by an overland route between 1537 and 1558, was followed by Gasparo Balbi and a number of Venetians. The Dutch, too, were represented in the travels of Jan Huyghen van Linschoten.

Linschoten sailed for the East in 1583 and remained there four or five years, during which time he collected extensive and pertinent information about the trade that spread out from Goa and other ports under Portuguese control. He later took an active part in stimulating the building of Dutch vessels and in sending them forth to seek a passage to Asia. Linschoten himself in 1594, in association with one William Barents, tried to reach India through a northeast passage "to saile into the North seas, to discover the kingdoms of Cathaia and China, northward from Norway, Muscovia, and about Tartaria." Barents sailed about Novaya Zemlya and Linschoten sailed into the Kara Sea. His activities stimulated a number of later expeditions to the north and also promoted the building of ships to try other passages to the East.

While Linschoten was pursuing his activities in the East, the English had been active in finding routes in the same direction by way of the Levant. Anthony Jenkinson, in about the middle of the 15th century, had already traveled in the Near East and in Russia, sailing down the Volga to the Caspian Sea and then arriving at Bokhara, when John Newberry and Ralph Fitch sailed from London in 1583. Accompanied by a number of others, they in due time reached Ormuz, only to be taken prisoners. They were taken to Goa. They finally secured their release and escaped. Three of the party made their way across India and then separated, and Fitch began a journey which took him to Bengal, Pegu and Malacca. It was not until 1591 that he finally returned to England, after his travels had again carried him to Ormuz.

By the early part of the 17th century individual English travelers to the East were not uncommon, but Thomas Coryat proved to be an unusual type. A member of a moderately wealthy family in Odcombe, Somersetshire, he managed to attend one of the universities and had gained a reputation as a wit and an eccentric. He traveled and tramped in Europe and collected notes for a slap-dash, popular and irreverent book which he called, not inappropriately, *Coryats Crudities Hastily gobled up in Five Moneths travell in France, Savoy, Italy, etc.* Ben Jonson, Beaumont and Fletcher and other important literary men of the time wrote extravagant verses which were published as a preface to his volume. This worked very well as a publicity stunt and the book of this "Odcombian leg-stretcher" had a large circulation and has become one of the rarities among the collectors of the curious literature of the Elizabethan period.

Coryat enjoyed some success and then, with a very small amount of money in his pocket, set out to travel to India. This was in about 1612. He tramped on foot, begged and borrowed his way along, stealing rides when he could. Today we would say he was hitch-hiking to India. He went by an overland route, attaching himself to caravan trains as the opportunity offered. Along the road he acquired fragments of the Eastern languages, including a fair command of spoken Persian. By the time he reached India he was able to carry on a rapid and scurrilous conversation with women in the bazaars and when the ambassador, Sir Thomas Roe, presented him at the Sultan's Court, he was able to make a short address. Coryat was observing and wrote some entertaining letters to his wealthy and influential friends in England. He might have developed into a useful writer, but unfortunately he was taken ill and died at Ajmer.

Coryat was a happy-go-lucky vagabond, but many of the English visitors to India were of a very different type. Roe, for example, studied the country and assisted one Baffin in producing a map of India. Others who traveled to the East were the independent traders or the agents of the East India Company. Among these was William Hawkins, who traveled with an expedition of the Company in 1607. He saw the Court of the Great Mogul Jahangir of India and his *Brief Discourse of the . . . Great Mogul* gave a comprehensive picture of this Court. William Finch and John Jourdain also made valuable geographical contributions during their residence in India.

Another was Peter Mundy, who remained in the country for seven years, from 1628-1634, and who gave a very graphic account of one of the recurrent famines in India which he witnessed in 1630. The famine began with a drought in 1630 and the effect of it ran through the years to 1632. It centered in Gujarat but spread into the neighboring districts. Mundy speaks particularly of its devastating effects in Broach, Surat and Baroda. He estimated that poor people to the number of one million died. The rich escaped, for they could buy up what little food there was. The posts of the East India Company were stricken too, and only a handful of its men escaped. Trade in calico and other goods ceased, for there were none left with strength enough to work at the looms. Mundy saw women in villages roast and eat their own children. Starving bands roamed the highways, and travelers who came into the famine district from more fortunate regions, were set upon and the flesh hacked from their limbs to be eaten. The wretches, he says, were lucky to escape with their lives.

But the English were not the only European nations represented in India at this time, for Francisco Pelsaert, a representative of the Dutch East India Company, spent 7 years in the country and was one of the earliest European visitors to give a description of the vale of Kashmir. Travel to the East was now rapidly developing and extending. Before the close of the 17th century, Kaempfer, a German scientist, had visited Ceylon, Sumatra, Java and Siam and had lived in Japan for two years. He later published a history of Japan and a rough geographical description of the country.

Then, in 1618, Thomas Samuel, in the service of the East India Company, made a remarkable overland journey from the coast of Siam to the coast of Burma, and thus opened up new territory to English travelers who followed shortly after him. It was not until the end of the 18th century however that reliable information was obtained with the expedition of Captain Symes to Ava, and this expedition marked the beginning of modern exploration in Burma.

When the Dutch began their trade in 1602 in Siam, the Malay Peninsula had already been circumnavigated as far as Trengganu by one Antonio de Miranda in the early years of the 16th century. And by 1612 the English had also established trade with Siam through the port of Patani in the Malay Peninsula.

Except for Marco Polo's book and the occasional communication from the Medieval Catholic missionaries in China, nothing was known about its interior until the beginning of the 17th century. The Portuguese traders had been content to touch at the ports, sail a short way up some of the larger rivers and return to Europe; and they left almost no records of their observations. The Jesuit missionaries, however, came to China toward the end of the 16th century and by the beginning of the 17th century had established a mission station at Peking. The founder of this mission, Father Matteo Ricci, had a lively interest in the collection of geographical information and made this serviceable by publishing a Chinese map of the world based on European maps. It was while he was engaged in this occupation that he had an astonishing addition to his information in the journey of Bento de Goes.

Goes, a Jesuit "lay" brother in India, had a great curiosity about China and the interior of Asia. As he expressed it, he wanted to know if China and Cathay were connected or were one and the same country. Starting from Agra, he passed through the cities of Lahore, Peshawar and continued to Kabul. Crossing the mountains by the Parwan Pass, he made his way through the Pamirs to the city of Yarkand, which Marco Polo had touched on his journey. From Yarkand Goes turned eastward, went by Turfan and reached Su-chow. He died before he reached Peking but not before he had sent communications to Father Ricci at the mission there. Thus, he had succeeded in following an extensive route through very difficult country in the heart of Asia and in connecting known territory in India with known territory in China.

After Goes, Antonio de Andrade, a monk, passed from India into the Himalaya Mountains and into Tibet in 1624. Before Andrade returned to India he had climbed the Himalayas, discovered one of the sources of the River Ganges, and had founded a mission station at Tsaparang. He seems not to have reached Lhasa, however.

Meanwhile, travel in China was developing from Peking as a center, and, though a rough relationship had been established between China and India, nothing much was known about the country to the north and west of China. But in

1676 Nicolas Spafarik arrived in Peking, after having crossed Manchuria from Siberian territory; and a little later one of the Jesuits traveled with a Chinese mission from Peking on the road to Russia. This was Father J. F. Gerbillon, who was well trained in systematic methods of travel and survey. Having first established contact with the Russians at Nerchinsk, he later explored the valley of the Hwang-ho, traveled in northeastern Manchuria, followed the Khingan Mountains and reëstablished contact with the Russians on the Orkhon. Thus, by the end of the 17th century he had linked the studies of the Russians in southern Siberia and in the Amur basin with his own observations and those of his predecessors in China.

But how had the Russians reached the Amur basin?

THE MARCH ACROSS SIBERIA AND VITUS BERING

AT the close of the 17th century, then, we know that the Russians had reached the Amur Valley. In some respects the waves of pioneering and exploration that carried the Russian people through the forests and across the tundras and steppes of Siberia had a certain resemblance to the advance of the European settlers in America from the Atlantic to the Pacific coasts. In each case there was a steady and rapid advance of European settlements and influence over a vast territory that had not previously come under European rule. In both cases the country was sparsely settled but held a number of tribal groups of nomadic or semi-nomadic character, each with its own economic life, language, tradition and religion. In each case the dramatic story is that of a growing population expanding and colonizing in the wilderness, moving out into untried territory—the story of the march of a people. It is a mass movement, colonists following closely on the heels of some unknown adventurer.

The movement of the Russian people eastward started in medieval times. Then, of course, there was no united Russia but a number of small kingdoms and principalities. One of the most important of these was the region of Novgorod on the deep and broad Volkhov, not very far from the present city of Leningrad. Novgorod was a kind of city-state. It was independent, self-sufficient, aggressive, republican in its organization and character. It had a motto: "Who can stand against God and the Great Novgorod?"

It has been said that the republic of Novgorod was the starting point for Russian history. From the old city its influences spread to northern and eastern regions; in the north to Lake Onega, Lake Vologda and to Archangel. Its colonists went east to regions near Nizhni Novgorod, Perm and Tobolsk. It had colonies on the Vyatka as early as 1174. By 1447 its influence extended beyond the Urals and to the region on the banks of the Ob. Old Novgorod was the only part of Russia that escaped the domination of the Mongols in the 13th century.

But Novgorod had to yield at last to the growing strength of the princes at Moscow. Moscow in turn took up the eastward extension of Russian power, crushing Novgorod in 1471 and replacing its influence in the East with active and aggressive rule. In 1556 Ivan the Terrible sent troops across the Urals and in 1558 he made a grant of land to a family named Stroganov. They were a family of commoners, but were strong, vigorous, devoted to military and commercial enterprises. The grant lay on the River Kama beyond Kazan near the Ural Mountains. From this point the Stroganovs extended their trade centers and their military influence eastward. They fought the Finns and the Tartars, enlisting in their skirmishes Cossacks from the Don and Volga under the leadership of Ermak.

The military bands of Ivan and the Stroganovs reached Sibir at the junction of the Tobol and Irtish rivers. Here ruled Kuchum Khan, a Mongol and an inheritor of the power that under Genghis Khan had been represented in the Khanate of Sibir. This post was captured and Ivan proclaimed himself ruler of Obdoria, Ugria and Sibir.

Presently the region was known as far as the River Ob and in 1587 Tobolsk on the Irtish River, a branch of the Ob, was founded. This town became an important trading and military center.

From here commenced the rapid and almost unprecedented advance of the many nameless adventurers that in less than 100 years carried the power of the Russian people all the way to the Pacific Ocean. It was rough work of the most strenuous and brutal character by rough pioneers. They pushed their way along the great system of lakes and rivers that reached through the Siberian wilderness. They rode on the steppes where riding was possible. Occasionally a small group would be diverted from the westward advance and follow one of the great rivers to the Arctic Sea, just as Mackenzie had done in America. Often they had difficulty with native tribesmen; often they started on false leads and trails that carried them into impossible regions. But the advance went on and we can trace it rapidly by the dates at which parties of Russians founded settlements or reached some of the important points in Siberia.

From Tobolsk other towns were founded along the River Ob in the beginning of the 17th century. Tomsk, for example, was founded in 1604. It is interesting to note that the early towns beyond the Urals were being established about the same time that the first English colonists were reaching Jamestown and Plymouth. From Tomsk it took 6 years for the traders to penetrate to the valley of the Yenisei. Here some pioneers followed the Yenisei to the Arctic Sea and turned eastward along the coast to the Piasina River. But there was no way eastward along that forbidding shore. So from Turukhansk on the Yenisei they pushed up a tributary now known as the Lower Tunguska. This river seemed to flow from the east. They ascended it and from its headwaters a short passage carried them to the upper waters of the great Lena River. Just as the Lower Tunguska led to the Lena so an Upper Tunguska, which ran more or less parallel to the lower arm, led from the Yenisei to the headwaters of the River Angara, and so to Lake Baikal. Yeniseisk was founded in 1619 and Yakutsk, on the River Lena, in 1632. It was Elisei Busa who traveled down the River Lena to reach its delta in 1617. From the mouth of the Lena he turned westward and explored the desert tundra coast to reach the River Olenek. Then he turned to the east and followed the coast as far as the River Yana.

These tundra coasts of Siberia are among the most desolate and dreary spots on earth. The shore is low and the coastal plain a vast expanse of arctic moss. The forest there lies several hundred miles to the south along the upper courses of the great rivers. The climate of this shore is so severe that the ground is frozen solid for many feet below the surface. During the brief arctic summer, with its continual sunlight, only the upper few feet of the soil thaw out. The water formed by this thawing process cannot escape because of the underlying ice. There is then only a few feet of mud lying over these vast frozen places and in this mud the tundra moss flourishes, holding water like a sponge. There is no soil on which man can set foot without sinking knee-deep in moss and mud. In winter everything freezes solid. The snows descend and are driven by the arctic gales into wavy ridges that also freeze and harden. On these low coasts even the river estuaries and the arctic seas are difficult to follow and to navigate. The exploration of this coast is a monument to human perseverance.

In the interior, Yakutsk became a center for a new push eastward. Then the great Stanovoi Mountains blocked the progress and had to be penetrated and skirted. But the sea of Okhotsk was reached in 1638. Thus, in about half a century these adventurers had by their collective effort spanned the great sweep of Siberia from the Urals to the eastern sea.

We have spoken of this as "the march across Siberia." Raised above the scene by the eminence which some few centuries give us, we may with a certain Olympian air call it a march. To the men who carried it out it can hardly have seemed anything so simple. They cannot have seen the plan or what each individually contributed to it. They were only struggling men cut off from their fellows by hundreds of versts of monotonous, endless forest, of turbulent river-courses, of icy desolation. To them it was a panting, crawling struggle, an endless series of bloody skirmishes and battles. Scene by scene they acted out their drama on a titanic stage, the greatest land-mass in the world, a setting that dwarfed and yet dignified the rude pageant that moved across it. For atmosphere they had the furious contrasts of a truly continental climate—coldest of winter gales, the stifling heat of long summers. In the south along the steppes there were scenes lit by the full glare of the sun, almost tropic in its intensity; and in the north long interludes of darkness illuminated only by the wavering and fantastic light of the aurora. It was a play for heroes and those that came into it had some training for their parts. The men like Elisei Busa, Atlassof and Deshnev were Cossacks from the Don, men trained to the river-boat and saddle, at home in camp and field, suspicious of city dwellers, loud in song and laughter, bloody and vengeful in battle. They were used to long marches and not unacquainted with death. Where one failed another moved forward.

And of course only a small group of Russians had penetrated to the farther regions of the East. Their hold upon the country was tenuous and they were surrounded on all sides by hostile and barbarous tribesmen. It was probably only because natives of Eastern Siberia for the most part led a nomadic existence and were split into small groups that the Russians were able to make their way amongst them. The advance had been very rapid and had been carried out largely by adventurers, traders and small military bands. The country had not been carefully studied and only the general character of the main routes was known. But the work went on, expanding and amplifying in all directions. In the Far East, Yakutsk became a center for travel. From here the rivers Yenisei and Kolyma were reached. The country of the Chukchees in the northeastern part of Siberia was first invaded by the Russians just before the middle of the 17th century. Atlassof reached Kamchatka in 1697. The tip of Kamchatka was reached in 1706.

At this time and in this quarter of the world there emerges the name of a man who was by intent an explorer. This was Deshnev, who went with a considerable party into the country of the Chukchees but met with reverses. He then secured a ship and sailed on the Kolyma River. It is also claimed for him that from the mouth of the Kolyma he sailed along the Arctic shore and was the first to round the extreme northeastern peninsula of Asia. His ship was wrecked but he came ashore, making his way by land to Anadirsk on the Anadir River.

While this advance in the extreme northeast was going on, a corresponding effort was being made in a southeasterly direction. Here the object was to gain a foothold along the Amur River. In this part, progress was not so easy. Toward the middle of the century the Russians advanced from Lake Baikal and Yakutsk in the general direction of the Amur, making some attempt at systematic exploration. But about the Shilka and the upper Amur, the Russians ran into resistance from the local tribesmen and also from the Chinese. Raids and bloody feuds followed and progress was difficult. The Russians made it a rule to exact tribute from the local tribesmen into whose territory they advanced. This had much to do both with the resistance they met and with the savage tactics they employed to overcome that resistance.

Again the Russians reached the sea. Poyarkov succeeded in cutting his way through to the Amur and following the river to its mouth and in returning successfully to Yakutsk. But he, like many of his associates, was a savage and unrestrained adventurer and the Russian government was soon aroused to the importance of bringing to this region official methods of colonization. Parties were sent exploring and a number of military posts were founded. A passage was developed from Lake Baikal to Nerchinsk on the Shilka River. It was from this point in 1676 that Spafarik, acting for the Russians, crossed Manchuria and reached Peking where he came in touch with the Jesuit missionaries and other Europeans. He was supposed to effect a reconciliation between the Russians and the Chinese but was unsuccessful in this and some of the hard-pressed Russian outposts had to withdraw from the Amur region.

The rough work had been done in the 17th century. The 18th century work was of another character. It was better organized, proceeded more methodically and had a more scientific purpose. It attempted to carry out more careful surveys and to fill in the patches that had been omitted in the work of the previous century. Stretches of the north coast had never been visited and, though great difficulties presented themselves, ships working eastward from Archangel reached the coast opposite Novaya Zemlya and the mouth of the Ob and finally encountered the Taimir Peninsula. This most northerly point in the Eurasian land-mass was finally rounded by Chelyuskin in 1742. His name will always be connected with the history of exploration along the northern coasts of Asia, for this cape bears his name. Only this year a vessel named after him was sunk near Bering Strait in the gallant effort which the Russians are now making to develop further knowledge of their country and to find, if possible, practical routes of communication along this arctic frontier.

A number of travelers with scientific purposes began roaming through different parts of Siberia in the 18th century. Messerschmidt, a German naturalist, traveled to the valleys of the Ob and the Yenisei. He worked his way as far east as a region beyond Lake Baikal and reached a little lake, Dalai Nor (Lake Kulun), which is part of the Amur River system. He had as his companion on the river trips a Swede named Tabbert. Renat, another Swede, traveled through Siberia, penetrated the mountain ranges and advanced into the Mongolian desert to the region about Lob Nor. He left an excellent map of this little known part of the world. But not all the scientific work was being done by foreigners. Peter the Great was much interested in obtaining information regarding his empire. He wanted particularly to know the character of the empire in the East. He sent Bering to find out.

VITUS BERING (1680-1741)

VITUS BERING was a Danish officer in Russian employ. Previous to his expedition in the East, Bering had already sailed on explorations of lesser importance. His instructions now were to sail along the eastern coast of the Kamchatka Peninsula and to follow it northward. This shore line ran in a northerly and easterly direction and it seemed likely at the time that it might be connected with America. Bering started from St. Petersburg in 1725 and spent two years transporting supplies and equipment across Russia and Siberia to the sea of Okhotsk. The equipment was put aboard a ship and sailed to Kamchatka. Then everything had to be carried across Kamchatka and a vessel built on the shores of the eastern sea. In the summer of 1728 Bering sailed from Kamchatka with two lieutenants, Spangberg (also spelt Spanberg) and Chirikov, as directed. He came at last to East Cape which was already known to lie beyond the country of the Chukchees. Bering passed through the strait which now is named after him. He saw no land to the north or to the west and felt he had carried out his instructions and proved that Siberia was not connected with the American continent, so he turned back. The next year, at Kamchatka, Bering heard from the natives that they had seen land farther to the east. He spent the year surveying the peninsula of Kamchatka and sailing off to look for the reported land but found nothing.

In 1730 Bering was back in Russia making his reports which stimulated a further interest in Far Eastern exploration. The Russian Academy of Sciences now also took a hand in furthering and planning exploration. The most elaborate and extensive plans were drawn up. An arrangement was made for ships under naval officers to sail in the East on exploring voyages. Official scientific observers were to accompany those ships. The scientists were also to work in shore parties. These European scientists included Müller, the historian, de la Croyère, the astronomer, Gmelin, the naturalist, and George William Steller, the physician and naturalist. Bering found himself involved in many of these plans and responsible for an extensive program. Indeed, it is probable that the plan for exploration made by the Academy of Sciences was evolved on too large a scale. Though Bering dealt with these enterprises there were many difficulties and delays and Bering's own plans for sailing to the American continent were frequently postponed.

Most of the equipment and supplies for the various undertakings had to be moved from European Russia to the Pacific coast. Spangberg set out in 1733 and Bering followed him some months later. There were the usual years of hard work and anxiety in transporting great stores of goods over such vast districts in wagon-trains, bullet-carts, river boats, etc. Even then he was not finished with his general directive task. De la Croyère was working by Lake Baikal and in the Amur Basin. Müller was working in the Baikal region. It was the purpose of these men to improve the knowledge of Siberia and to lay the basis for mapping the country. Spangberg and others sailed on expeditions along the Kurile Islands and to Japan in the years 1738-1739. It was 1741 before Bering felt free to turn his attention to his own particular exploration.

His instructions this time were to see if there were indeed any islands or lands lying eastward from the Kamchatka coast. He was also to sail eastward until he reached the American coast, wherever it might lie. Two ships had been built and fitted for the explorers in the East. They were named the "St. Peter" and "St. Paul" and lay in the little harbor in Avacha Bay on Kamchatka. The combined names of the two ships have ever since been used to designate this place —Petropavlovsk. The physician and scientist, Steller, had proceeded to Kamchatka with the idea of sailing with Spangberg for Japan. Bering summoned Steller and persuaded him to join his own ship. Steller proved a careful observer, a first-rate scientist and an active and practical helper on the expedition. His journal gives us our best account of this eventful voyage. The second vessel was commanded by Chirikov and in this ship de la Croyère was the scientific observer.

The two ships sailed together on a southeasterly course, casting about here and there for the reported land which never materialized. In heavy weather the ship of Chirikov was separated from Bering and not sighted again. Bering gave up looking for the reported land and bent his course in a northeasterly direction, feeling that this would take him most directly to the North American coast. The weather was fair and the vessel ran for four weeks before a steady westerly wind. July 15th, Steller, according to this journal, reported that he felt sure that they were approaching a coast line and that he had sighted land. But he was discredited and it was July 18th before the official landfall was recorded. It was a long rugged island, partly covered by timber. At its eastern end lay a great land with beaches and a river running to the sea and above all a white dome which they named Mount St. Elias. The island also they christened St. Elias, though it is now known as Kayak Island.

Steller landed on Kayak Island while the ship filled some of its water casks. He walked along the beach and climbed a hill. He examined a winter storehouse of some Indians and made notes comparing the way they prepared food with that of the Koryaks and Chukchees and Kamchadals. He sampled their dried salmon and found it very good but the Indians themselves had stolen away and he saw none on the island.

Steller was very critical of the naval officers, though he later spoke with high regard and with a just estimate of character of Captain-Commander Bering. At least Steller was right in that the ships' officers had no clear plan of how to proceed with an explanation of the American coast now that they had found it. The ship was taken westward and in a somewhat random fashion followed the coast line, passing Kodiak Island, stopping along the Shumagin Islands, running under the Alaskan peninsula and along the Aleutians. Now that they had turned back the ship often encountered headwinds and often also spells of fitful weather. There were periods of thick and blinding fog which created for a vessel attempting to move among unknown waters and unknown islands the most difficult and trying of situations. Food and water were beginning to run short and the men commenced to suffer from scurvy. The multiple hardships told on the men and Steller's journal reflects the disagreements, difficulties and quarrels that arose between the Russian and the foreign scientists, the leaders and the men.

In view of what happened later it is interesting to note that a comparison of log-books shows that the vessel of Chirikov and the vessel of Bering were following the same general course and on several occasions were probably within a day's sail of each other.

During a spell of clear weather Steller and others from the ships landed on some of the islands and here observed and traded with a party of Eskimos. Here also Steller counseled all aboard the ships to gather spoonwort and other antiscorbutic grasses and herbs, but they paid no attention to him and Steller was able to gather only enough for himself and the commander.

It was a sick and dispirited group that manned the vessel on her homeward course. Sickness increased and fewer men were left to man the ships. Hither and yon they picked their way through the storms. When the ship finally sighted the deserted and hitherto undiscovered

Copper and Bering islands, the officers thought they had already reached Kamchatka, but were way out in their reckoning. It was in this belief that they began approaching the islands. It was more by good fortune than good seamanship that the vessel came through great swells which broke on a stony reef and was brought-to in a small harbor on Bering Island. Here the men were landed from the ships to rest and secure food and if possible recover their strength. There were no trees on the island and only a limited amount of driftwood along the shore. The only shelter they could make for themselves was to dig pits on the shore and to cover these with sails taken from the vessels.

In these hovels the exhausted men spent the winter. The scanty supply of food was supplemented by hunting marine animals. Seal and sea-otter were taken and these both added to food supplies and provided pelts for clothing and protection. But packs of blue foxes came to the camp to worry and annoy the exhausted men. They tore at the tents and ripped apart clothing. They carried off the drying meat of seals and sea-otter. They broke into the stores and they even attacked and chewed at the sick men who were too feeble to fight them off.

Bering was carefully moved ashore and it was hoped that he might recover but his strength was ebbing rapidly and he died before a month on the island was out.

Several of the other adventurers also died but Steller preserved his health and was continually active in doing what he could to aid the injured and to provide safety for the dwindling expedition. Steller also continued his work of exploration. He covered the land thoroughly and preserved an account of its geological structure and of its fauna and flora. It was here that with the aid of the men he caught and studied the great marine mammal called "Steller's sea cow." Within 35 years of the time Steller wrote his description it was hunted to extinction.

During the winter gale the ship was finally driven ashore and wrecked. The desperate men salvaged what they could from the vessel and used the timber of the old ship for the construction of a small boat. Upon their success in building this vessel their chance of escape and safety depended. A man named Starodubzov, who was not a trained shipwright but who had worked in the building of the vessels at Kamchatka, took charge of the building of the boat. By spring he had built a vessel in which the company left Bering Island. Lieutenant Waxel had survived and took charge of the boat on its voyage to Kamchatka. Only 45 men lived through the winter and reached this point in 1741.

The official and scientific explorations took a breathing space after the Bering voyages. But the Russian movement eastward was not halted even by the straits and the ocean. The fur hunters and the traders took up the trail again. To them the bleak Aleutian Islands and Alaska seemed like a rich and promised land, for they had heard of the great numbers of seal and sea-otter that came to lie on the rocks and beaches.

In 1745 Nevodsikof began to move along the Aleutian Islands and by 1762 another party under Glohof came to Kodiak Island off the south shore of Alaska. In the years between 1783-1787 Shelekhov planted a station on Kodiak Island and from here the Russians spread southward along the American coast. These traders later traveled as far as the coast of California. Note that the Russians were putting stations on Alaska, which was later to be American territory, at just the time when the American colonies were winning their independence and becoming a nation. Note also that Spanish explorers from the time of Juan de Fuca, 1592, on had been searching the coast from California northward, so that the wave of exploration that started from Russia eastward and the wave that started from Spain westward met on these shores in the last quarter of the 18th century. At this time, too, Cook came sailing to the Alaskan coast in his English vessels. He met here the Russian adventurer Ismaelof whose name in Cook's journal becomes Smyloff. Cook had departed only a few years when the French vessels under La Pérouse came also to the Alaskan coast.

THE RIM OF ASIA

SO many-sided and so long-continued was the advance into Asia that, though several explorers marched over the same route or over closely parallel routes, there was an opportunity for each to make an important contribution to geographic knowledge. During the time of this advance the sciences of astronomy and of surveying and cartography were developing very rapidly, so that what was good work for one generation still left an opportunity for improvement by the next group of travelers. We have seen already how the Russians traveling across Siberia put a band across the northern part of the continent and how they joined with European travelers in China and sent out off-shoots that reached into the steppes, the mountains and arid deserts of the continent. Each advance in Persia, India, China and Siberia assisted the explorers in the interior of the continent by cutting down the territory they had to traverse from a reasonably safe base of operation.

PERSIA

FROM the days of Xenophon down to the present time a succession of travelers has passed through Persia recording their experiences and observations with the greatest variety of emotions and in the greatest variety of styles. The emotions run from horror and resentment through apathy and distaste to approval, admiration and enthusiasm.

Persia, lying between the East and the West, has served for thousands of years as a passageway for the movement of travelers and as a market for the exchange of goods. Thus, partly in consequence of its central position, Persia has had a continually shifting and rich historical background. Although parts of it have remained unchanged for long periods of time, parts have been changing rapidly in politics, in learning and the arts. Not infrequently, historical development and even geographical districts that were known to one generation of travelers have been lost or forgotten. Thus it is a country which is being continually re-discovered.

If the social discovery of Persia has been complex, this is in many ways only a reflection of the complexity of the country from a geographical point of view. It extends from the flat and arid lowlands on the south along the Indian Ocean and the Persian Gulf over mountain ranges and deserts to the lofty peaks of the north and the shores of the Caspian Sea. In the lower deserts and in the Seistan depression, it overcomes the traveler with intolerable heat and thirst; and in the mountain region of the north it envelops him in icy gales and snow storms. It presents areas of great fertility and regions in which life is supported by wells, submerged water courses and old and elaborate systems of irrigation.

The invading armies of Greece under Xenophon and Alexander established the historical contacts between Europe and Persia. Nearchus coasted on the southern shore of Persia and along the Persian Gulf, entering the Pasitigris River to meet Alexander near Susa. Friar Oderic passed through on his overland return from China; and Marco Polo, when he was unable to find a suitable ship at the port of Ormuz, went northward the whole length of Persia to leave it through the passes of the northeastern mountains.

Early exploration in Persia came about because it was on the highroad to India, and Ormuz was still the great port and center of trade for the travelers of the 16th and 17th centuries who were on their way to India and the East. Varthema came here on his voyage to the East and made a swing through Persian territory. Pedro Teixeira, a Portuguese Jew, traveled extensively in Persia and resided there for some time before his travels carried him to India and farther. And in 1611-1616 Thomas Coryat crossed Persia on the main caravan route on his way to India, but his observations were scattered and superficial. Pietro della Valle, who visited Persia in 1616 while on a voyage to India, stayed some time in the country and left a general but very valuable series of observations about it.

Before the 17th century was out, however, there were a number of other useful and important travelers whose combined work made a very satisfactory picture of Persia at that period. Among these were Thomas Herbert and A. Olearius and the German naturalist, Kaempfer. Kaempfer, who accompanied the Swedish embassy of 1683, had a background of scientific learning which equipped him for realistic description. Among other interesting facts he shows us that at the time Persia was regarded as a country of great importance by the European powers. In Isfahan he met representatives from Poland, Germany, France, Russia, Siam and the Papacy, as well as embassies from Arabia and Central Asia.

In the 17th century the travelers to Persia were many. Among these were J. B. Tavernier, J. de Thévenot and John Chardin. Their work was supplemented by Dr. John Fryer, a surgeon of the East India Company. On his way home he remained for two years in Persia.

The Russians, the French, and the English all had their eye on Persia during the 19th century. The Russians were expanding rapidly into Asia and their explorers and military men made extended travels in Persia, Afghanistan and into Tibet. This prompted the English in their turn to take a greater interest in these areas than they might otherwise have done. Both maps and journals improved throughout the 19th century.

Malcolm and Kinneir traveled together in Persia, Armenia and Asia Minor in the early years of the 19th century; then in 1810 Christie and Pottinger, disguised as horse-dealers, passed undetected through nations whose natives were born horse-dealers from time immemorial. How they succeeded in doing this remains something of a mystery. Yet they crossed Afghanistan from Baluchistan and Persia as far as Isfahan.

One of the remarkable travelers in the period around 1830 was an American, Charles Masson, who spent many years in the East and sent his reports to the British authorities. He entered Persia by way of Tiflis, then went to Tabriz, Teheran, Resht, Meshed and Herat. Then he passed to Sind and the Indus Valley by way of Kandahar and spent some time in India. His most valuable information, however, came from his travels and residence in Baluchistan and Afghanistan. In Afghanistan he remained seven years. His writings dealt with the politics and ethnology of the different cities and districts, but his descriptions of the tribes and their customs are general and unmethodical.

After Masson a series of British agents in various disguises traveled to Merv, Bokhara and other cities and met various fates. Moorcroft died between Bokhara and Herat; Stoddart and Conolly were murdered at Bokhara. The British and Afghan wars altered the character of exploration in these regions.

In 1850 the Russian officer, Khanikov, carried out a series of surveys in northern Persia, covering a wide area and locating astronomically about a hundred points to serve as bases in his mapping operations. Major-General Goldsmid in 1870-1872, as part of a political mission, started the series of boundary surveys which added greatly to modern Persian geography. These surveys, in which Majors Lovett and D. B. St. John participated, did for eastern and southern Persia what Khanikov had done for northern Persia. Detailed exploration of special regions followed: Lovett in the Elburz Mountains in 1881-1882; Lynch in Luristan in 1889; Sawyer in the Bakhtiari country in 1890; Maunsell and P. Galland in Kurdistan and many others.

Then in 1889-1891 a general French scientific commission under De Morgan made some further contributions to geographical knowledge. But two thorough and extensive series of travels and exploration are due to Englishmen. Each of these men served on a number of boundary and mapping commissions and by traveling widely linked up the work of the men who had preceded them. Sir Thomas Holdich of the India Survey worked from the Khyber Pass west and north. He served on the Perso-Baluch Boundary Commission and the Pamir Boundary Commission, and a thorough covering of Afghan and Baluch territories was carried out under his direction. Sir Percy Sykes performed similar services in Persia. Before the World War he had already completed six long and extensive journeys. During the war he further directed the work of officers in the employ of the India Survey in a new series of travels. Sykes's work, however, has not been confined to geographic and topographic interests, for he has contributed as well to historical and archæological inquiries.

There have been and continue to be many opportunities for special travel and investigation in Persian territory. Some years ago Professor A. V. Williams Jackson of Columbia University created a fresh interest in Persia when he carried out extensive travels there during his studies of Persian linguistic and religious history. In the last few years the archæological work at Persepolis of the American Oriental Institute and of the American Institute of Persian Art and Archæology and its museum associates at Asterabad, Damghan, and now at Rayy have shown the need and the possibilities of a whole new series of investigations on Persian soil. There is here an almost unique opportunity for cultural and historical studies.

India

MODERN exploration in India began when the Survey of India was started in 1802 with the measurement of a base-line near Madras. Then in 1830 George Everest, for the Survey, began laying out the "gridiron" or "chain of triangles" which has since been extended until it has covered nearly the whole of the Indian Empire and has served as a basis of all modern maps. By 1855 the system had reached into Kashmir and in 1911 was joined at last with surveys carried out by the Russians from the north. Of course, progress in the Survey was not always rapid and regular and was often only advanced at great personal sacrifice. The whole story of the Survey of India forms a remarkably human drama, with science and romance playing their parts amid varied and beautiful settings.

MALAY PENINSULA

THERE were two great names in Southeast Asia in the early days of European travel—Pegu and Malacca. Pegu, a city and district in southern Burma, had a fabulous quality and held a strong fascination for travelers. Barbosa, Varthema, Pinto and Balbi among the early travelers had reached it and had brought home stories of its extensive trade and the great wealth of its king. Pegu musk and other products of interior Asia passed to the ocean trade, and in upper Burma lay the rich mines of rubies. Even in the early years of the 17th century English and Dutch traders were passing up the rivers to Prome and even to Ara, but modern surveys did not begin here until the end of the 18th and the beginning of the 19th centuries. The jungles were difficult and the country away from the rivers particularly hard to reach. Later wars between the British and the Burmese interrupted exploration and after the war of 1885 Britain, having already annexed the district of Pegu, took all of Burma and in "mopping up" her officers reached and reported all parts of the country.

Malacca was the great port and trading center in the days of the Portuguese and the early traveler who reached Pegu also reached Malacca and many others came to trade. Barbosa and Magellan were among those who fought there to establish the Portuguese power. Malacca was then what Singapore later became, a crossroads of the seas where trading vessels from southeastern Asia, from China and from the East Indies met and mingled. The coasts and the smaller ports of the Peninsula gradually became known and the Kra Isthmus was crossed in 1839, but the interior was hardly known at all until the end of the 19th century. McCarthy worked on the Perak River in 1883 and Sir Hugh Clifford directed the survey in Trengganu in 1895. The Federated Malay States Survey is now carrying on systematic surveys, but several small forest areas still remain unvisited.

SIAM

THOMAS SAMUEL of the English East India Company crossed from Siam to Burma in 1618, and so commenced inland exploration in this area. But for a long while nothing further developed and it was the French Catholic missionaries crossing the Malay Peninsula from Mergui on the west coast who first made a real impression on the country. Louis XIV followed this up by sending more missionaries and ambassadors. The French kept a hold on the country and published early accounts of it. In the 18th century similar developments were extended to Cochin-China, but geographic knowledge remained very imperfect and it was long before the interior of the country was penetrated.

FRENCH INDO-CHINA

THE real opening up of Cambodia and the country behind it was carried out by an official French expedition in 1866. Doudant de Lagrée was in general command but he died before the work was completed. Francis Garnier was second in command, later the leader, and always the most active traveler in the party.

The expedition started in 1866 at the mouth of the Mekong River, following the main stream as far as the Se-don and the Se-mun, both of which were partially investigated. The party was a large one and by dividing forces a considerable territory was covered. Garnier, for example, made a circuit which took him in the neighborhood of Angkor and Tonlé Sap. This route added a thousand miles of new territory to the map. In general, the valley of the Mekong was followed as far as Luang Prabang. Somewhat above this point rapids developed in the river and the party proceeded overland, passing through the Shan States and finally reaching Yunnan in the province of the same name. Here the leader of the expedition was too ill to proceed farther and he died before the return of his party. But Garnier proceeded and reached the town of Ta-li-fu. This was the first time that this district had been visited by Europeans.

It had been the original intention of the expedition to develop a travel and trade route to southern China. Actually the route proved impractical and Garnier himself found that it was unwise to retrace his route down the Mekong. He succeeded in reaching a branch of the Yangtze Kiang and in following this river to the sea, taking ship from Shanghai and so returning to Saigon in Cambodia. Garnier's work opened up a tremendous new territory. In addition to maps and geographical studies, the expedition also laid the foundation for work in geology, in archæology and in studies of the many local tribes.

Since Garnier's time the French have continued in systematic fashion to carry out surveys in the territories under their jurisdiction until today little remains unsurveyed.

CHINA

WE have seen already that the earliest geographical explorations in China were due to the French mission stations and that the Russians advancing to the Pacific through Siberia sent Spafarik to reach Peking in 1676. The Jesuits continued to be the chief source of information regarding China throughout the 18th century, and it was not until the latter half of the 19th century that general scientific exploration of China came to life. Klaproth and other Russian travelers occasionally reached China by overland routes from Siberia.

In the middle of the 19th century, following the so-called Opium War and a number of other campaigns, Englishmen gained access to the main Chinese rivers and began traveling in the interior. For example, Blakiston followed the Yangtze for 1,800 miles, Morrison traced the course of the Grand Canal, Michie went from Tientsin to Moukden and a number of other expeditions were all carried out in the single year 1861.

BARON FERDINAND PAUL WILHELM VON RICHTHOFEN (1833-1906)

PERHAPS the greatest contribution of an individual to the making of the geography of China was that of Baron Ferdinand von Richthofen, who in the years between 1868 and 1872 traced a network of routes over southern and central China. Altogether he made in this period seven expeditions. In these expeditions he covered the whole of the east coast of China from Moukden and the Liaotung Peninsula as far as Canton. He explored the Shantung Peninsula. On his fifth expedition he crossed the country from Canton to Peking; he followed the Yangtze for almost the full length of its course and traveled overland in the interior through the provinces of Shansi, Shensi and Szechwan. These journeys were carried out only a few years after the travels of Garnier and the expeditions of the two men approached each other at several points. Their routes actually paralleled each other in the Yangtze Valley. Any intervening territory was soon filled in by other explorers. Richthofen was a well-trained geologist and geographer and he greatly improved the general maps of China.

The Russians, the English, the Americans and Germans have all made contributions to the geology, zoölogy, historical and ethnological studies of China. It was, for example, a remarkable American geologist and traveler, Raphael Pumpelly, who in the year 1863 carried out a most thorough-going investigation of Chinese geology. In more recent years, however, Chinese scholars have been trained in western methods of research and have begun to assume responsibility for scientific advances in their own country. Sometimes important advances have been made by coöperation between Chinese and western scholars. One of the most spectacular finds in recent years, the discovery of Peking Man (*Sinanthropus pekinensis*), was due to the interest and combined activities of the eminent Swedish geologist, Professor Andersson, and the Canadian anatomist and geologist, Dr. Davidson Black, who was then attached to the Geological Survey of China, and to the continuous interest of the officers of the Geological Survey itself.

A Note on Tibet and Lhasa

LOGICALLY, "inaccessible Tibet" and "forbidden Lhasa" should have remained unvisited until late in the history of exploration, but events defied logic, as they have a way of doing. There is no doubt that Tibet and Lhasa have been difficult goals—perhaps their very difficulty has been an attraction, for they have proved a great magnet for travelers and have been frequently visited.

This seems to be not very well understood. When a general book by Dr. Sven Hedin was recently published a number of reviewers seemed to have assumed that nothing was known about Tibet until Colonel Younghusband carried out his advance into the country in 1904. Perhaps the spectacular character of this event, combined with an air of secrecy and mystification that some modern writers have delighted to throw about their excursions in this country, have erased from people's minds an appreciation of how old and extensive is the history of exploration in Tibet.

It has seemed to me interesting, therefore, to prepare a list of travelers in Tibet and of visitors to Lhasa (Visitors to Lhasa are indicated by a *). I do not pretend that the list is complete, but it is long enough and orderly enough to show how ancient is the history of travel in this part of the world. It gives also a cross-section view of the general character of Asian travelers. I think we cannot help being impressed with the amount of adventure and of human effort that is required to make us familiar with a new landmark or to lead us to change an accepted point of view.

* *1330:* Friar Oderic of Pordenone worked in a mission station in China, saw the Courts of the Chinese Empire, and on his way home from China passed into Tibet and visited Lhasa.

1624: Antonio de Andrade went to Tibet, traveled in the country and obtained permission to found a Christian mission station at Tsaparang. He went to India and returned to Tibet with priests and established a mission that had a continuous life of 16 years.

1626: Stephen Cacella and John Cabral explored in the eastern Himalayas and obtained much geographic knowledge about the Himalayas and Tibet during their mission to Shigatse.

* *1661:* Grueber and D'Orville came to Tibet on their way between China and Rome. They remained in Lhasa for six weeks. When they left they went through Nepal to Agra. Their travel served for a time to improve the map of Asia.

* *1707:* Capuchin missionaries came to Lhasa. Another Father arrived in 1709.

* *1716:* Hippolyte Desideri went to Tibet with the idea of reëstablishing the mission at Tsaparang. He stayed in Tibet four years and visited Lhasa. He left a good geographical description of the parts of the country that he saw and described also the people and their customs.

* *1724:* Samuel van de Putte, a Dutchman, traveled through Persia to India and from there through Tibet and reached Lhasa. Thence he went to China. It is hard to understand just what moved him to remain silent but he never published an account and before he died ordered his journals to be destroyed.

* *1740:* Cassiano Belligati da Macerata traveled through Nepal and reached Tibet, visiting Lhasa. He left an account and visited and described the mission station.

1774: George Bogle went to Tibet from India in an attempt to develop trade. Warren Hastings was about this time in India and did much to encourage exploration and commercial development in Tibet.

* *1811:* Thomas Manning traveled in the Himalayas and passed from Bhutan to Lhasa.

* *1843:* Huc and Gabet were two missionaries who were sent to carry on their teachings in Mongolia. They made a remarkable journey to Lhasa.

The Pundits were a group of native Indians trained in scientific methods under the direction of the Survey of India. It was T. G. Montgomery who developed the plan of using such men in surveying those parts of Asia that were not accessible to the European traveler. In considering their work we must remember that natives of India were almost as much under suspicion in Tibet as European travelers. They accomplished their remarkable journeys under the most trying of circumstances. They proved as devoted to scientific duty as any group of European explorers. Among those who traveled in Tibet we may list the following.

* *1866:* Nain Singh succeeded in reaching Lhasa. The results of his journey were of great importance, for he surveyed an elaborate route of 1,200 miles, defined a road from Katmandu to Tradom and a great Tibetan road from Lhasa to Gartok, traced the course of the Brahmaputra flowing near Lhasa and took observations of the temperature of the air and boiling-water by which the height of 33 points was determined. When he retired because of broken health, he was rewarded a village in Rohilkand with a revenue of Rs. 1,000 and made a Companion of the Indian Empire.

1868: Mirza Shuja was a Persian but was known as a "Pundit." He reached the Oxus and explored the north of Afghanistan and went through the Pamirs. He was murdered in his sleep at Bokhara.

1871: Hari Ram explored around and near Lhasa. He was known as "M.H." and obtained valuable information about the upper valley of the Arun River. He opened out the geography of nearly 30,000 square miles of unknown territory.

* *1871:* Kishen Singh was known as "A.K." and explored successfully in Lhasa and the surrounding country. He made valuable contributions to geography.

1876: Ata Mahomed explored the gorge of the Indus.

* *1879:* Sarat Chandra Das went to Lhasa and Central Tibet. He wrote a book called *A Journey to Lhasa and Central Tibet.*

1884: Kinthup went with a lama to explore the Brahmaputra but was sold into slavery. He escaped four years later to India. He confirmed the belief that the Brahmaputra, the Dihang and the Tsangpo were all one river.

An interesting confirmation of the value of the work that the Pundits carried out is contained in the writings of Captain Noel who was a member of the British Mount Everest expeditions of 1922 and 1924. Captain Noel writes, "As late therefore as the early years of the present century, the journey of Sarat Chandra Das, who passed by the east and the journey of the Explorer Pundit 'M.H.' who passed by the west, comprised the sum total knowledge of the approaches to Mount Everest."

1871: W. W. Rockhill attempted to reach Lhasa from Kuku Nor but was turned back midway in his travels. He was allowed to go southeast and proceeded to Ta-tsien-lu. He made another attempt in 1891-1892.

1872-1888: Colonel N. M. Prjevâlsky explored extensively in the Tibetan regions during these years. He was the first of the modern scientific explorers to explore Tibet, coming within 170 miles of Lhasa itself, approaching it from the north.

* *1891-1894:* Baza-Bacha made a pilgrimage to Tibet, during which time he successfully reached Lhasa.

1891: Captain Bower passed through the northern part of Tibet from Leh on his way to China. He added a good deal of information about the northern part of Tibet.

1893: Dutreuil de Rhins and * Grenard tried to cross Tibet to Lhasa. De Rhins passed through northern Tibet, came very near Tengri Nor and traveled in the direction of Si-ning in Kansu. Grenard reached this city after great difficulty and De Rhins was murdered on the way.

1895: Littledale penetrated within 43 miles of Lhasa, then had to turn westward and emerged at Leh. It was at this time that Sven Hedin extensively traveled in Tibet and Central Asia. He made no particular attempt to reach Lhasa but devoted himself instead to surrounding regions.

1903: Captain Rawling and Lieutenant Hargreaves carried on survey work in northwestern Tibet.

* *1904:* Younghusband made his military invasion of Tibet and a march to Lhasa. Younghusband had previously in 1886 started from Peking, crossed the Gobi Desert, skirted the eastern Altai Mountains and reached Hami. From Hami he went by way of the base of the Tian Shan to Kashgar to Yarkand and crossed to India by the Mustagh Pass which he discovered.

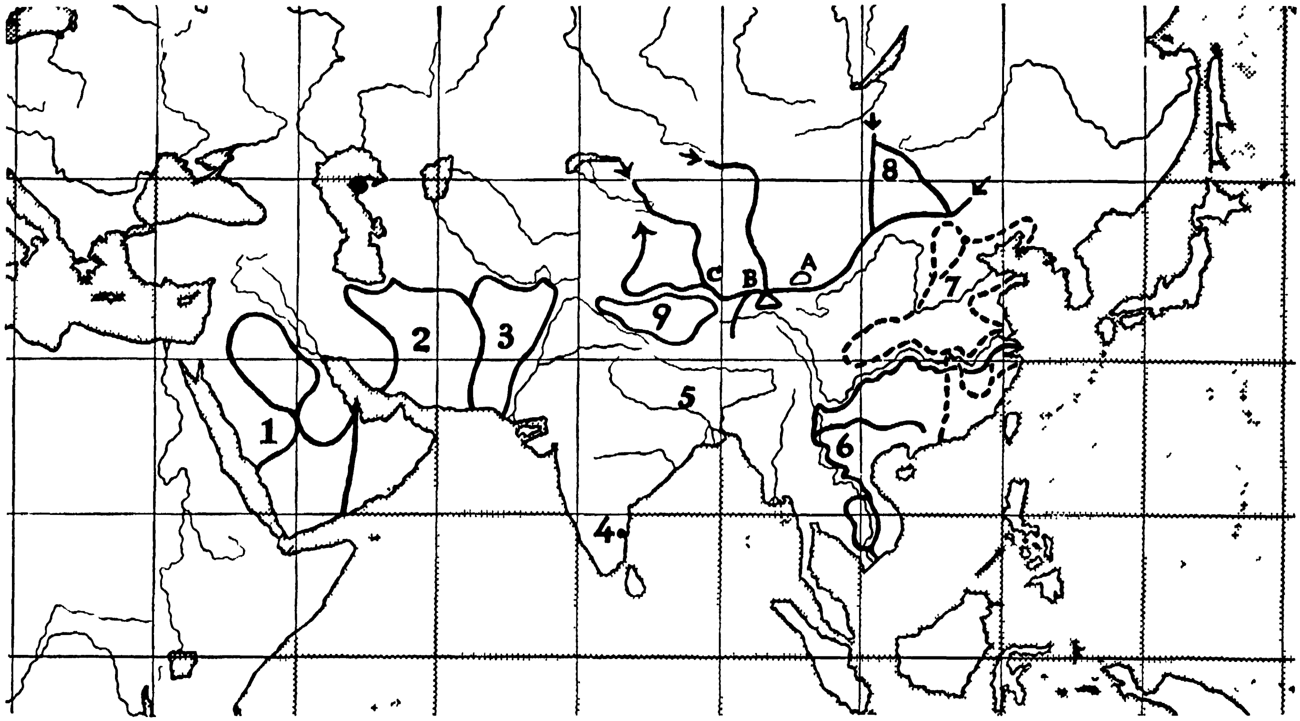
INNER ASIA

IN the meantime exploration in western China and Inner Asia was not at a standstill. Despite the tremendous distance and the great hardships involved, occasional stragglers penetrated into various areas in Central Asia.

Here again it was the work of missionaries that served to stimulate interest in modern exploration. In 1843 two Lazarist missionaries, Abbé Huc and Abbé Gabet, went out to carry on new missionary work in Mongolia. At the time little was known about Mongolia, and there was only the vaguest information as to what conditions they would find there or what people they would be able to convert to Christianity. They wandered widely in Mongolia and, despite the many delays and hardships encountered, they were drawn on by the continuous fascination of the vast regions they were penetrating and were sustained by a belief in the supreme importance of their religious quest. The study of Buddhism itself interested the Fathers and it was a desire to make the acquaintance of the Buddhist monks and the lamas that led the good Fathers farther and farther afield. Often they were separated and often delayed but at last they succeeded in reaching Lhasa. It appears from the account which Abbé Huc has left of their travels that he reached the conclusion that the Buddhist monasteries and the hierarchy of priests had in it much that was akin to the structure of the Catholic Church and that there was a certain parallel between the Pope and the Dalai Lama. He seems to have felt that if only the Dalai Lama could be persuaded to espouse Christianity a whole new kingdom of converts would be won over to Catholicism at a single stroke, as it were.

Abbé Huc was not, of course, a trained geographer. He and his companion traveled simply and among many hardships. They did not preserve very careful records and added little to general geographic knowledge. It is even asserted that many of the descriptions they made of their trip are confusing and are wrong in detail. This may be so, but it is true that they had been from China to Tibet and even to Lhasa itself; it was equally true that Abbé Huc wrote a fascinating description of his travels and adventures and that this circulated widely and attracted great attention in Europe, not only among the religious persons but among scientists also. It undoubtedly did a great deal to stimulate travelers to undertake further journeys in Inner Asia.

Chief among the nations to be interested in Inner Asia was Russia and greatest of the Russian explorers was Prjeválsky. At the time Prjeválsky began his work almost nothing was known scientifically about the interior of Asia. Some members of the British Survey had traveled from Leh to such towns as Kashgar, Yarkand and Khotan but only preliminary maps of these regions had been produced. Some travelers had reached Mongolia but the records there were



SOME IMPORTANT EXPLORATIONS IN ASIA

(1) Areas of Exploration in Arabia (2) Area in Persia covered by Khanikov, Sykes and the Boundary Commission (3) Area of boundary surveys under Holdich (4) Lambton lays the base line for the survey of India at Madras, 1823 (5) Everest starts a "gridiron" on the Ganges Plain, 1845-1850 (6) Garnier goes up the Mekong, 1866 (7) Most important routes of Richthofen in China (8) The chain of routes in Inner Asia followed by Prjevalsky, 1871-1888 (9) Area of Tibetan researches by Pievtsov.
A Kuku Nor B Tsaidam Swamp C. Lob (Lop) Nor

still very imperfect in character. Before Prjeválsky died, his own researches had carried him across Central Asia in a number of different directions and his countrymen and other travelers had added other routes, so that the present map of these vast areas is in a very large measure due to his pioneer work and to the work that others carried out under the stimulus of his example.

NICHOLAS MICHAILOVITCH PRJEVÁLSKY
(1839-1888)

WHEN Prjeválsky was a small boy, he often ran away from school to play in the woods and tramp in the fields, and he soon earned the reputation of being the "bad boy" of the neighborhood of Otradnoe in the province of Smolensk. The traditional punishment for bad boys was to send them off to serve in the army in the Caucasus and neighbors advised his mother to pack him off, and the sooner the better. Fortunately, the family decided to continue to put up with his pranks.

The family possessed three thousand acres of land and 135 serfs and thus were neither rich nor poor. Prjeválsky got a reasonably good education in the local gymnasium and at sixteen years of age went off to serve in the Biélefsky regiment in Moscow. He had grown up into a dark-haired, curly-headed, handsome young man. He might have enjoyed to the full the rather vacant and dissipated life of a young army officer, had he not also been endowed with a reflective disposition and a persistent hankering for distant travel.

He continued to feel that it was his duty and his fate to become a traveler. With this in mind he applied for service on the Amur. Just why such application should constitute a breach of etiquette, it is hard to understand, for service on the Amur can hardly have been among the desirable assignments. His application, however, resulted in his being put under arrest for three days and caused him to decide to enter the Staff Academy, which he finally did. Later he became a teacher and librarian in the school for young officers and in 1867 was assigned to staff duty in eastern Siberia. Here he undertook to make a census and report on the population of the Usuri River. This occupied the next few years, but when the work was completed, it was discovered that his report dealt as much with natural history as with the population itself. The Russian Imperial Geographical Society, however, was pleased and rewarded him with a silver medal.

In 1871 he commenced his serious work with explorations in Mongolia, commencing at Kiakhta near the Orkhon River south of Lake Baikal. He went through Urga and then crossed the Gobi Desert to Kalgan. He made a swing through northwestern Mongolia, traveled through Ordos and back to Kalgan and Peking. For his time and for the difficulty of travel this was already a very considerable journey in territory that was not well-known but, compared to Prjeválsky's later activities, it was a mere preliminary exercise.

The following year he set out from Peking and pursued in March, 1872, the course of the caravan route to the west, traveling in a considerable part the route that had been followed by Huc and Gabet, who had left picturesque but somewhat exaggerated descriptions of the region. After the usual difficulties and delays of following the desert road, Prjeválsky came to the region of Kuku Nor, a salt lake that lies surrounded by mountains and at the edge of the desert. Like old Abbé Huc, Prjeválsky was deeply impressed with the beauty of this region. He happened to arrive in October when the air was clear, the waters of the lake blue and sparkling, and the upper portions of the mountains shining in a mantle of new fallen snow.

He continued westward, coming to the region of the Tsaidam Swamp with its vast expanse of bog and of withering, salt-encrusted reeds marking the outline of what he believed had not very long ago been a great lake. From the Tsaidam Swamp region he turned southward to Tibet in the hope of reaching Lhasa but his resources were becoming exhausted and he could not risk delay. He turned back, following the way he had come until he was again at the base of the Ala Shan Mountains. From here he struck directly northward, crossing the Gobi Desert, which brought him to Urga and Kiakhta. On this, as on all his expeditions, Prjeválsky had many interests. He had carried out a survey of his routes, had collected specimens of plants and animals and had given a description of unusual geographical features of the country. Among these regions in which he had traveled one that interested him particularly was the mountainous and moist section surrounded by deserts. This region lay between Kuku Nor and the Yangtze Kiang headstreams.

Apart from his strictly geographical work, Prjeválsky frequently wrote vivid and popular accounts of his experiences. Here, for example, is his description of the impression which the Gobi Desert made upon him:

> "The barrenness and monotony of the Gobi produce on the traveller a sense of weariness and depression. For weeks together the same objects are constantly before his eyes: cheerless plains, covered in winter with the yellowish withered grass of the preceding year, from time to time broken by dark rocky

> ridges, or by smooth hills, on the summit of which the swift-footed antelope . . . occasionally casts a light shadow. With heavy measured tread the laden camels advance; tens, hundreds, of miles are passed, but the changeless desert remains sombre and unattractive as ever. . . . The sun sets, the dark canopy of night descends, the cloudless sky glitters with myriads of stars, and the caravan, after proceeding a little further, halts for the night. The camels show unmistakable satisfaction at being freed from their burdens, and lie down at once near the tents of their drivers, who busy themselves in preparing their unsavoury meal. In another hour men and beasts are asleep, and all around reigns the deathlike silence of the steppe, as though no living creature existed in it. . . ."

In his later travels Prjevâlsky, starting at Kuldja, crossed the Tian Shan Mountains to the Tarim basin and to the region about Lob (Lop) Nor. On another trip he followed the Black Irtish River and then crossed into the Dzungaria region, crossing the desert and coming to the oasis of Hami. Here he rested and then continued in a southeasterly direction to reach again the region east of the Tsaidam Swamp, which he had already reached from the east on his first trip. On his fourth and final expedition he connected up portions of his previous routes. He began at Kiakhta, south of Lake Baikal, crossed the Gobi, followed his old route to Kuku Nor, passed down the Tsaidam Swamp, discovered and named the Tsaidam and Columbus Mountain ranges, crossed the Altyn Tagh to Lob Nor and went out by way of Keria and Khotan to make a final crossing of the Tian Shan Mountains.

Such journeys, of course, won for Prjevâlsky recognition among the scientific bodies of Europe and also a wide circle of less highly trained readers and admirers. On one of his early expeditions he had sustained himself and traveled continuously for two years on a grant of only $2,000. Now he was able to lead expeditions of considerable size and to count for sufficient financial support for all necessary equipment, apparatus and supplies. Everybody now could see the great importance of his work and the special gift that he had for carrying it out. On the scientific side his work was extraordinarily successful, for he had a real gift for zoölogical work as well as for geographical studies. He first discovered and described the wild camel as "thin, slim, not bigger than a horse, and with two humps, with a keen scent; climbing like goats; and hunted by the natives for the sake of their wool"; and his name was also attached to the Mongolian wild pony, "Przewalski's Horse" (*Equus caballus przewalskii*).

Whatever his scientific success, like many other travelers Prjevâlsky entertained a personal goal which he never succeeded in reaching. It was his great desire to come to Lhasa from the north. Several times he was turned back in the midst of Tibetan territory, once coming within 170 miles of Lhasa. What such travel meant is clearly pictured in a brief quotation from his own writings:

> "The caravan journey across Northern Tibet in the autumn and spring of the year is never unaccompanied by danger; and casualties to men and beasts are frequent. So many of the latter perish that a large reserve of camels or yaks is always taken; but notwithstanding this precaution, the men have sometimes to abandon all they possess, and to think only of their own safety. In February 1870, a caravan which left Lhassa 300 strong, with 1,000 beasts of burden, in a violent snow-storm, followed by severe cold, lost all the animals and fifty men besides. One of the survivors related to us how, when they found that their beasts were dying by the score every day, they were compelled to abandon first their merchandise, and such things as were not absolutely indispensable, then part of their supplies, until they were actually reduced to trudge on foot and to carry their own food on their backs. Of the entire force of camels only three were kept alive by feeding them on barley. The argols were buried so deep beneath the snow that it was almost impossible to find them, and the travellers had to cut their clothes to pieces and

burn them for fuel to keep themselves warm. Every day one of their number fell down dead, and the sick were left to their fate."

Prjevályky was about to start on a final journey in 1888 with a new attempt on Lhasa as one of his objectives. He reached the town of Karakól and died there. It was his last request that he should be buried on the shore of Lake Issyk-Kul, his grave to lie on the green slopes between the snow-clad peaks and the blue waters of the lake.

Prjeválsky had crossed the routes of all the earlier travelers in Central Asia. He had seen part of the territory that Carpini and Rubruck traversed; he had followed along the caravan routes that Marco Polo pursued, had traced out a great part of the journey of Gabet and Huc and had actually conversed with Samdadchiemba, who been a sort of guide to the missionaries.

In his turn Prjeválsky became an incentive to other travelers. Before he died Sosnovski had crossed Central Asia from the southeast to the northwest, from Hanchung to Zaissansk; and Pievtsov had extended greatly the surveys in Tibetan territory.

Much has remained for subsequent explorers in Central Asia. Much still remains to be done, despite the great gifts as scientists and the great energy as travelers which the explorers of these routes have brought to their task.

The explorers of these regions seem to be built on a heroic mold and to set for themselves the most expansive and lofty ambitions. In order to be persuaded that the traditions of the great travelers are not dying, we have only to turn to the maps and the published works of the Swedish meteorologist, geographer and archæologist, Sven Anders Hedin, and to the achæological work carried out for the India Survey by Sir Aurel Stein. Dr. Hedin, a man of great learning, resource and energy, has directed many expeditions in Central Asia. For over 40 years he and his assistants have been making contributions to the archæology, geology, meteorology, as well as the geography, of this region.

As a boy in Stockholm, Hedin was much impressed with the work of Nordenskiöld and other explorers. Like Amundsen, he deliberately trained himself for a career in exploration. He had already traveled widely in Persia and Turkestan by 1893 when he commenced the first of his entries into Tibetan territory and other sections of Central Asia that still remained unexplored. He never reached Lhasa but wisely devoted himself to useful work in regions from which he was not barred. Some years ago he made a spectacular find of thousands of manuscripts dating from 206 B.C. on the site of the prehistoric city of Loulan in Chinese territory. At 69 years of age Dr. Hedin is now on an expedition in Sinkiang, exploring portions of the ancient silk caravan route.

Although primarily interested in archæological research, Sir Aurel Stein, together with his associates, usually trained surveyors, has made important contributions to the topography of Central Asia which has resulted in the production of valuable topographical maps. His travels in search of archæological materials, begun in 1900 and continuing to the present day, have extended over a vast territory in the mountains and deserts of Inner Asia. In 1900 he carried out archæological explorations for the Indian government in Chinese Turkestan. This was followed by a second expedition in 1906-1908, which carried him through Central Asia and western China and for which he received the Royal Geographical Society's Medal. Subsequently he carried out further explorations in Central Asia, Persia, Upper Swat, Baluchistan, and Makran.

His most recent work has been concerned with the probable routes of the Aryan invasion of India and with the relation of the Aryan invaders to the ancient civilizations represented in the prehistoric cities of Mohenjodaro and Harappa in the Indus Valley.

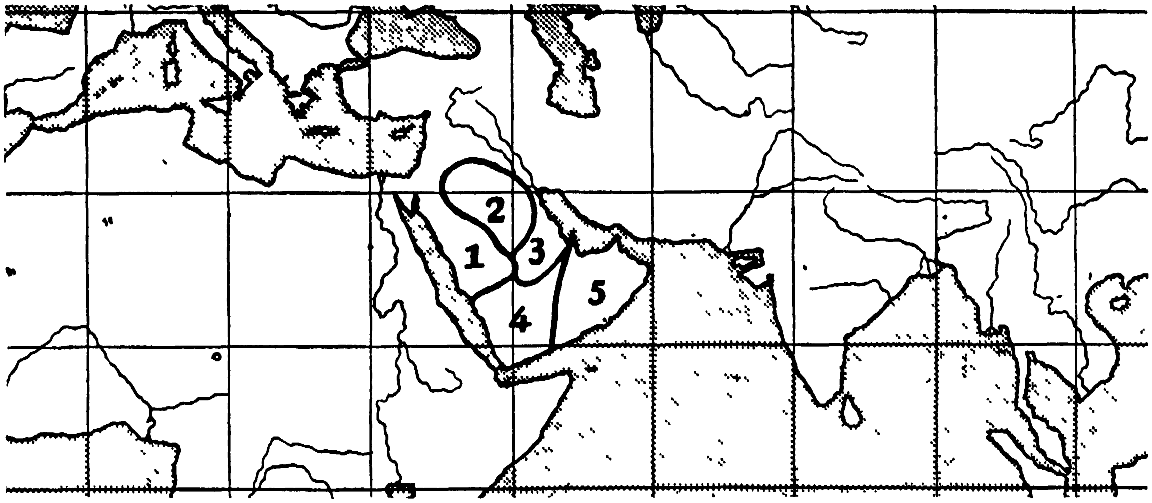
Dr. Roy Chapman Andrews has conducted for the American Museum of Natural History a series of expeditions from 1916-1930 in the Gobi Desert and other Mongolian territory. These expeditions have made improvements in the maps of the region but have been notable for the contributions to archæology made by Dr. Nels C. Nelson and to zoölogy and vertebrate paleontology made by Dr. Walter Granger and Dr. Andrews himself. One of the features of his travel was the use of the motor car in exploration, which resulted in the eventual opening of the Gobi Desert to their use for commercial purposes. His work has shown Central Asia to be rich in reptilian and mammalian fossils.

ARABIA

AMONG the corners of the world that have remained to our own day a fascinating and unsolved problem for the explorers is the desert peninsula of Arabia. It is a curious circumstance of the history of exploration that the first recorded voyage, that of Hannu, the Egyptian, in 2750 B.C., probably had as its goal a part of the Somali and Arabian coast. The record says quite clearly that they were destined for Seba in Punt. Punt was then to the early Egyptian travelers and scribes a reasonably well-known land. Since that time knowledge of all the world has been incorporated in our tales of exploration and on our maps. Yet, even today, the scientists and explorers are in dispute regarding the reputed city of Seba (Saba, Sheba) or the several cities that may have borne that name. The southern section of Arabia may still be reckoned a savage and almost impenetrable country. It is only since the year 1930 that the traverses of Bertram Thomas and of H. St. J. B. Philby have given us a knowledge of the so-called "empty quarter" of Arabia.

It was never a lack of interest that kept Arabia unknown for so long a time. Indeed, the shores of Arabia and a few of its ports have been known to the merchants and the travelers of all ages, but the great interior has presented to the inquisitive the combined barriers of deserts, rugged mountains, and people sometimes fanatical and warlike and always difficult to deal with and independent. From one point of view, the two difficulties—the severity of the land and the hostility of the people—are simply aspects of the same problem. The aloofness and primitive character of the Arabian tribes are often no more than a reflection of the barrenness and difficulty of the country in which they dwell. Here, if anywhere, man can maintain his existence only by the most intimate knowledge of and adjustment to the soil and the climate.

As in the case of Africa, a real and scientific knowledge of Arabia began to develop only in the 19th century. A Spaniard, Domingo Badia y Leblich, traveled from Cadiz to Mecca in 1803, gave some description of the region of Mecca and Medina, and from astronomical observation fixed the position of the holy city of Mecca. He was succeeded in 1814 by J. L. Burckhardt, who first went into the country with an Ottoman expedition and who had an opportunity to describe Mecca and the surrounding country. One of the great travelers in Arabia was G. A. Wallin, who



EXPLORATION IN ARABIA, SHOWN BY AREAS RATHER THAN ROUTES
(1) Doughty (2) Gertrude Bell (3) Shakespear (4) Philby. (5) Thomas

made trips in 1845 and 1848. The first trip was along the southwestern country to Mecca and Medina and again he crossed through the Midian desert to the Euphrates and Bagdad. The map embodying all the previous expeditions was prepared by Ritter in 1852.

Richard F. Burton came to the Midian section in search of gold in 1877 and, though he found no gold mines, he did acquire additional information about the region. He also visited and described again the holy cities.

J. Snouck Hurgronje visited Mecca in 1885, remained there for a period of five months and gave a very complete account of the city and of its customs. This veteran Islamic traveler is still living and working in the city of Leyden.

CHARLES M. DOUGHTY (1843-1926)

BUT ten years before Hurgronje's voyage the work of the greatest of all Arabian travelers had already commenced. Charles M. Doughty was a quiet English scholar who began with no pretensions as an explorer and with no particular funds to back him. He went into the Holy Land and then into the district beyond the Jordan and inspected the city of Petra. His intelligent curiosity, and a developing sympathy with the people prompted him to try a journey farther to the east and south. With his lack of equipment and very limited resources he saw at once that there was no way to accomplish this, save by adopting as completely as he could the method of life and travel of the native tribes. When the time came he joined the great caravan that was making its way to the sacred cities. He traveled as a pilgrim but made no pretense of a belief in the Islamic faith.

For several months Doughty traveled with the caravan, following them as far as Medâin Sâlih. Doughty had come to study rock inscriptions and other archæological records, and he remained for this purpose while the caravan passed on. Then he moved into the desert, traveling for two years with the desert tribes, moving from one Bedouin group to another. He lived completely the life of the tribe, sharing its hardships and, so far as he could as a Christian, participating in the tribal life. He achieved an intimacy not only with the external behavior of the tribe but also with the motives and philosophies of its members. He did not romanticize the desert or its inhabitants; he did not hesitate to express both his approval and his annoyance with the varying features of Bedouin life. Yet, he achieved a description of the Arabian scene and an insight into the Bedouin character that raise his book to the level of great poetic and philosophical writing. It is a sober philosophy and an informed poetry, springing from long-continued observation and scholarship.

In conveying his insights and his appreciations Doughty developed an individual style of writing that makes his book, *Travels in Arabia Deserta*, on first acquaintance somewhat difficult to understand. It has a type of construction and a turn of phrase that is Doughty's own or that is perhaps a reflection upon English usage of Bedouin habits of thought and expression. It is a style sufficiently flexible to permit Doughty to describe geological and geographical structures as he does, for example, in his descriptions of the volcanoes of the Harra, or to convey the philosophy of the Arab or to repeat the personal gossip of the caravan and the village. Though a personal style, it is a style that is also timeless, with a variety of detail that somehow reflects the unity and the timeless quality of desert life itself.

No doubt one of the reasons of Doughty's success with the Arabs was his combination of insight and sympathy with resolution and independence of character. His success with them also depended on his capacity for uncomplaining endurance. He showed himself capable of traveling with them through the heat and starvation of a summer season in the desert. He had none of the advantages that a modern European traveler might bring to comfort him through this trying time. Indeed, he was often poorer in resources than many of the tribesmen themselves. He was not dispensing charity, offering bribes or paying informants. When he was offered hospitality he accepted it without extravagant thanks and without humility, achieving that balance of manners which makes nomad life in this difficult environment endurable.

Doughty's travels carried him along the fringe of the Central Arabian mountains to a point opposite the cities of Mecca and Jedda, and he left Arabia from this port.

Doughty was the first and perhaps the greatest of Arabian travelers, but he was not the last. He has been succeeded by a number of explorers who were remarkable, not only by reason of their travels but also by reason of their personal characteristics. It is almost as though no stereotyped character, no hurried or ill-considered expectation could succeed in desert travel. There may be parts of the world where an ordinary man with some knowledge and no more than a reasonable amount of preparation, resolution and courage can add to geographical knowledge, but this is not the case in the Arabian desert. Here the minimum requirements of character already approach heroic proportions; here the traveler must have in his own right an independence, resolution and simplicity of character that demand respect from the Arabs if he is to travel safely, and a deep scholarship and insight if his work is to be of genuine importance.

In 1913-1914 the redoubtable English woman, Miss Gertrude Bell, began a journey which swung inland in an arc from Damascus to a point near Amman, where Doughty had also begun his journey. She then passed parallel to Doughty's track but kept well to the east of it to a point near Teima and continued in an easterly direction to Jebel Hail. From there she made a notable crossing of the desert in a northeasterly direction to Kabala and Bagdad.

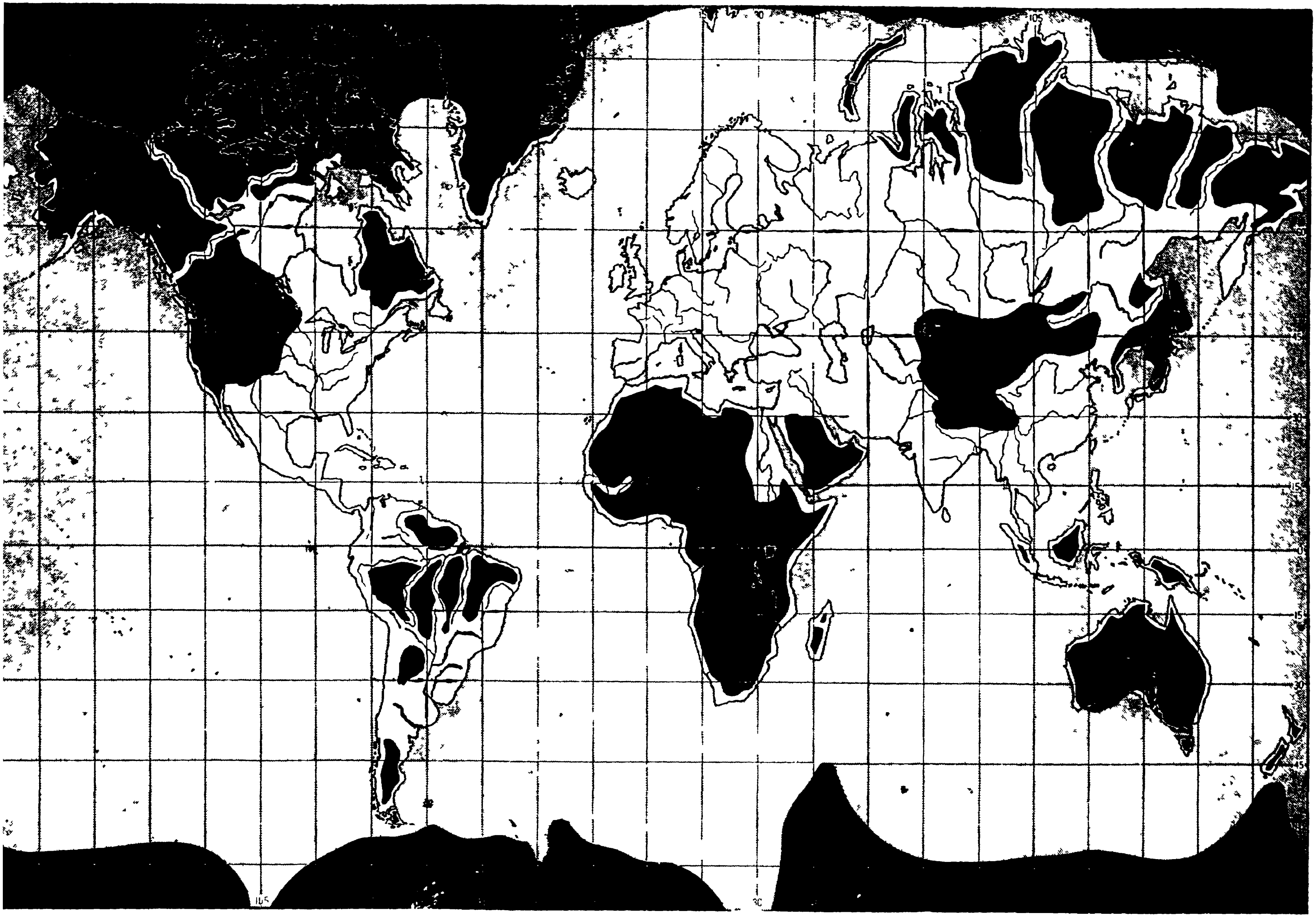
Captain W. H. I. Shakespear, commencing his travels in 1909 at Koweit on the Persian Gulf, made a number of expeditions into the interior. He succeeded in reaching Riyadh in the very center of the peninsula and then in traveling up the center of the peninsula across Miss Bell's track and emerging on the Egyptian frontier.

One of the romantic chapters of Arabian exploration was added during the War when Colonel Lawrence crossed from Egypt to northwestern Arabia and began arousing the tribes and organizing them into effective military instruments for attack on the Hejaz railway system. The great part of Colonel Lawrence's work had a military and political significance, but he was able at the same time to carry out surveys and to add information of a geographical and geological character. Colonel Lawrence was also a profound student of languages and of customs and his book, the *Seven Pillars of Wisdom,* revived an interest in Arabian tribes and added also to an understanding of their customs.

In 1917 Mr. H. St. J. B. Philby, starting from a point on the Persian Gulf below the territory explored by Shakespear, also reached Riyadh. From this point he made a loop southward in completely unknown territory, reaching the Wady Dawasir. Returning to Riyadh he crossed the desert from this point to Mecca and Jedda.

In 1930 Bertram Thomas astonished the world by landing near Dhufar on the southern coast and traveling in the mountains of the Hadramaut. From here he made a remarkable crossing of unexplored desert to Dohak on the Persian Gulf. This was the first crossing of the so-called "empty quarter" of Arabia.

In the succeeding year Philby was again in the field, adding information about the desert north of Thomas's route. These two desert travelers have conquered an extremely difficult territory, penetrating regions that are regarded as dangerous and difficult by the nomads themselves. They have succeeded not only in adding to geographical knowledge but also in bringing back notes of importance in the field of anthropology and the natural sciences. Thomas, in particular, has been interested in studying the relationship between southern Arabia and the portion of the African coast which lies opposite it. Thus, in the last few years we have seen another of the mysterious and dark areas of the world removed from the map.

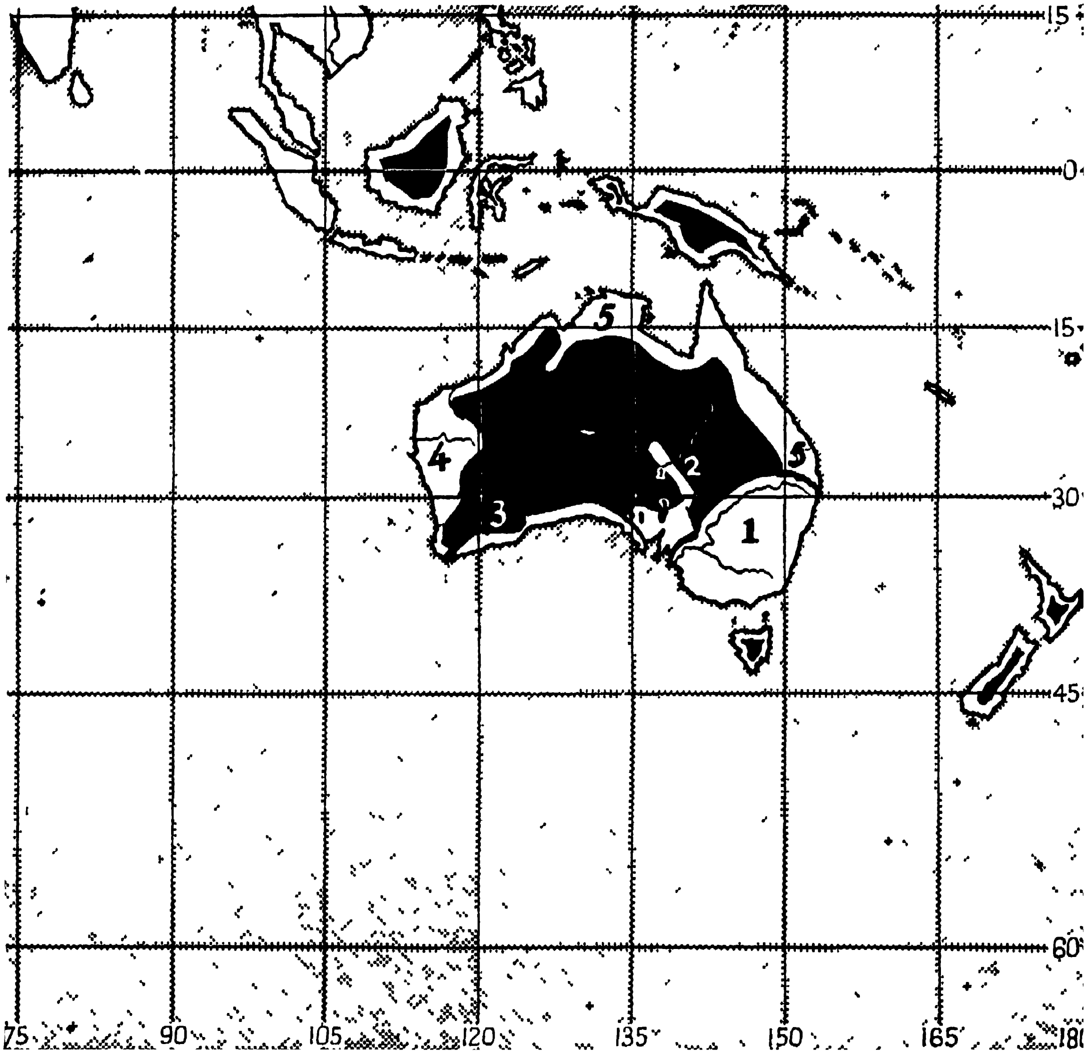


THE WORLD IN 1800

Based in part on Arrowsmith's world map of 1790. Black spaces on our map correspond with areas left blank by Arrowsmith or very imperfectly represented The routes of Mackenzie in 1793 and Park in 1795 1797 have been added Arrowsmith still shows Tasmania and Australia as a single land but in 1798 Bass first sailed through the strait between them

PART VII

THE PACIFIC AND AUSTRALIA



AUSTRALIA, 1800-1857

(1) Area explored by Flinders, Oxley, Sturt and others about 1800-1850 (2) Sturt to Great Stony Desert, 1844-46 (3) Eyre, 1841 the Great Australian Bight (4) F. T. and A. C. Gregory, 1846-1861. (5) Leichhardt, 1845 A. C. Gregory, 1855

THE PACIFIC AND AUSTRALIA

BY 1550 the Pacific, the world's largest water area, had already been crossed several times. But its shores were unknown and the early navigators came across only a few of its many scattered islands, though many commanders did not hesitate to launch their vessels on the Pacific crossing. It took centuries of voyaging before they disclosed the extent of the ocean, discovered the continent of Australia and many island groups that break its vast expanse.

Travelers from Europe arrived at the opposite shores of the Pacific at almost exactly the same time. The Portuguese traveling eastward reached the Spice Islands—that is, the Moluccas—in 1511. And Balboa, having traveled westward, caught his first glimpse of the Pacific on September 25, 1513. It was only seven years later that Magellan's ships, sweeping around South America in 110 days of constant sailing, traced a great arc through the Pacific and so gave a rough idea not only of the extent of this ocean but of the size of the world. Between the southern tip of South America, the point of Magellan's departure, and the Philippines where he ended his Pacific journey, countless islands star the ocean. Yet by a curious accident Magellan chose his course in such a way that in all these days of travel, he saw only two small deserted islands of the Paumotu group before he picked up the Ladrones and the Philippines. His trip gave the impression that the Pacific was a vacant ocean.

The next definite crossing was made by ships that had been built in Mexico and that sailed under the direction of Cortés with his cousin, Saavedra, in command. Saavedra sailed from Mexico to the Moluccas but he died while attempting a return passage. His men then lost heart, turned the vessel about and went back to the Moluccas where they were imprisoned by the Portuguese.

No further islands were reported in the Pacific until 1542 when Gaetano, a Spanish navigator, was attempting a passage from the Philippines to Acapulco in Mexico. He is supposed to have arrived at the Hawaiian Islands, which were not revisited until Captain Cook arrived there in February, 1778. When Gaetano sailed, there was no settlement in the Philippines but a colony was established there in 1565 and in that year Andres de Urdaneta undertook, in thorough-going fashion, to make the first successful passage across the Pacific from the west to the east. He started from the Philippines and sailed well north until in about 40° he picked up westerly winds and let them carry him across the Pacific until he began to close with the American shore. His route ended at Acapulco in Mexico. This splendid bit of navigation established the recognized passage between two important Spanish possessions. A somewhat similar course was followed by the Spanish for many years.

The next voyages were made in the South Pacific. Sir Francis Drake had the distinction of being the first English seaman to journey to the Pacific. On his trip around the world, starting in 1578, he was driven southward from the Strait of Magellan by a storm, reaching a latitude of 57° S., where he came upon an island he called the "southernmost knowne land in the world." He believed that these islands were in reality the famed Terra Australis and mapped them accordingly. He also found that the prevailing westerly winds of the southern Pacific made it impossible to journey along the coast of the supposed continent. Drake later reached the North American coast at 43° N. latitude where he found a "faire and good Bay," probably that of San Francisco.

The belief that there was a large southern continent also moved Mendaña to undertake a voyage from South America into the South Pacific in 1567 and 1568. Mendaña discovered some of the Ellice, Solomon and Marshall islands. When he and his men reached the Solomon Islands, they thought they had discovered the coast of the great Southern Continent and so reported on their return. But during their stay on the islands, they had not found gold and had seen only naked savages. So there was no enthusiasm for another expedition and it was 28 years before Mendaña could start again. On this second voyage, he had as an assistant a young navigator and pilot who shared his passionate belief in the existence of a southern continent. This was Quiros.

PEDRO FERNANDEZ DE QUIROS (1565-1614)

QUIROS was 30 years old when he went to Peru in 1595 and obtained the position of captain and chief pilot with Mendaña's second expedition.

The expedition was a large one with 4 vessels, having in all some 378 persons, most of them soldiers under the charge of a Chief of Camp. Mendaña unfortunately elected to take with him his wife and a number of his relatives. Quiros soon realized that his instinctive hesitancy in accepting the position of chief pilot had been well founded. Señora Mendaña, a hot-tempered, insolent woman, had formed a strong family clique. The Master of the Camp was rough and tactless. But fortunately for the rest, Quiros knew his work and executed it thoroughly, heedless of constant difficulties.

On July 26th they sighted an island to which the name Magdalena was given. This was about 1,000 leagues from Lima. It was here that a peaceful visit of some 400 natives who came out to the ships in canoes, bearing cocoanuts, food and water, was turned by the Spanish soldiers into a panicky rout and a fight. Similar incidents were frequent, and it soon became apparent that they were not to be held in check. A group of four islands, including Magdalena, was named Las Marquesas de Mendoza. Here the adventurers ate their first bread-fruit, the record of which is considered to be the earliest description of this tropical food.

After sailing W.N.W., passing four small islands named San Bernardo, and an active volcano on Tinakula, one ship, the "Almirante," was lost at sea and never heard of or seen again. The remaining three vessels reached Santa Cruz (Queen Charlotte Islands), which was formally acquired for the Spanish throne and a settlement commenced. On the whole the natives were peaceful, but they were constantly attacked by the soldiers without provocation. The Camp Master believed Mendaña was incapable of getting them back home safely. Food supplies were running dangerously low. A round robin was signed asking Mendaña to set sail at once. The ships did not sail. Instead the Camp Master was murdered, with Mendaña's approval, as he was considered a traitor. Civil war broke out. Traitors and loyal men grappled with each other. Knives glinted in the bright tropical sun. Afterward Mendaña ordered mass to be said with attendance compulsory. The survivors were encouraged by hearing the vicar state that the deaths of the traitors had been ordained.

But even this reassurance did not stave off disaster. In a short time Mendaña fell ill and died. The plague spread like wildfire. To make matters worse, the native chief, Malope, had been treacherously killed, and the natives, encouraged by the weakened condition of the whites, were determined on revenge. On Quiros fell the leadership and responsibility. At last, on November 18th, the vessels set out for Manila, some 900 leagues distant. The sickness continued. In one month 47 died. The galeot, second of the ill-fated ships, disappeared at sea during the night. But even this did not prevent Señora Mendaña, who on the death of her husband had tried to seize command of the expedition and who called herself the Governess, from daily using a precious jar of fresh water for the washing of her clothes. On behalf of the parched men Quiros protested. In reply the lady seized the keys to the store-room where the water was kept, and thus settled the argument. On January 3rd they passed the Ladrones, but before they reached the Philippines they lost the frigate and were becalmed. They finally arrived on February 11, 1596. Much honor was immediately accorded the Governess and but little attention was paid to the young Spanish navigator who had brought his remaining company through unbelievable hardships.

Quiros went home. Meeting with indifference, he swore that nothing would stop him from making his own attempt to find the great Southern Continent. At Rome, he finally talked with Pope Clement VIII and stressed the value of saving "millions of Antarctic souls." The Pope gave him a letter to the Spanish government in which he recommended that Quiros be employed on this mission. After several false starts, he got away, was shipwrecked in Curaçao, in the West Indies, and went from there to Caracas. He was destitute on his arrival at Lima. After more and unexplained delays, three vessels were finally prepared—the "Capitana," which was Quiros's ship, the "Almirante," and a launch. In all, they carried 130 men and 6 friars. Luis de Belmonte Bermudez, who acted as his secretary, and the loyal and courageous admiral, Luis Vaez de Torres, were chief among Quiros's friends.

The voyage began December 21, 1605. The course was E.S.E. from Callao. At 30° S. the Southern Continent was supposed to exist. A storm forced Quiros to steer E.N.E. and he thus missed the discovery of New Zealand. However, he planned to reach Santa Cruz and go south again.

On February 10th they reached Anaa, or Chain Island, one of the Low Archipelago to the eastward of Tahiti. At this place, named Conversion de San Pablo, the landing party captured an old native woman, described as being at least 100 years of age, tall and large and having but a few teeth. Bermudez writes:

> "With this good capture the boat returned to the Captain, to show her to him, who was highly delighted at seeing a human creature. He seated her on a box, and gave her meat and soup from a pot, which she ate without scruple; but she could not manage the hard biscuit. She showed she knew well how to drink wine. A mirror was put in her hand, and she looked at the back, then at the front, noticed her good manners, and concluded that, when young, she was not bad-looking. She looked at all the men with interest, but she displayed the greatest pleasure in looking at the boys. She looked at the goats as if she had never seen them before."

Soon after leaving Anaa, Quiros came upon Taumaco (the Duff group).

On May 1st Quiros reached the large island which he called Australia del Espiritu Santo (really New Hebrides) naming the port Vera Cruz. Here, at last, was the Southern Continent. Or so Quiros thought. The place was a garden of Paradise and the many islands in the Hebrides group seemed to be a vast, uninterrupted land. When the ships were anchored, Quiros ordered a series of processions, religious dances, high masses and fireworks in celebration of his great "discovery." There was also a raising of the Cross, followed by the formal reading of six notices of possession.

The concluding order of possession read:

> "Finally, I take possession of this bay, named the Bay of St. Philip and St. James, and of its port, named Santa Cruz, and on the site of which is to be founded the city of New Jerusalem, in latitude 15° 10′ and of all the lands which I sighted and am going to sight, and of all this region of the south as far as the Pole, which from this time shall be called Australia del Espiritu Santo, with all its dependencies and belongings, and this forever and so long as right exists. . . ."

Quiros and his men remained here for 35 days from May 3rd to June 8, 1606.

At last the time came to complete the discovery. They were to continue southeast, but, on leaving port, a storm came up and Torres's ship returned to a safe anchorage. Quiros could not make port and was too ill to come on deck. His pilots were afraid to turn back and continued to Santa Cruz, designated as a meeting place if anything went wrong. After waiting some time for Torres, Quiros set sail for home and, making an arced course to the north, arrived at Acapulco, Mexico, on November 23rd.

In the meantime, the resourceful Torres, who had been waiting for Quiros to return, decided to set out himself. He sailed southwest, then north, and reached the bay and islands on the eastern end of New Guinea. He then went on to the southern coast and Torres Strait, with its many islands.

The voyage of 1606 is notable for the fact that it was one of the first to be taken without loss of life—except that of the Father Commissary who died of old age. Quiros was always kindly, and often too lenient. Remembering the cruelties of Mexico and Peru, he intended when he settled the great Southern Continent to convert the natives and treat them humanely.

At the end of this eventful but unsuccessful voyage, Quiros finally arrived at Madrid in October, 1607. With him was the faithful Bermudez and they were both destitute. There was not sufficient money to buy paper or ink for a Memorial setting forth the results of his travels. He wrote the first Memorial on the flyleaves of a pamphlet and sold his clothes for enough money to have it printed. His bedding went for a second, and, for the third, the royal banner, which had waved so proudly over Espiritu Santo, had to be pawned. When he had suffered 17 months of extreme poverty, the King saw fit to grant him 500 ducats. It is believed Quiros wrote 50 Memorials, of which 8 have been preserved and printed.

Beset by constant delays, subterfuges and treacheries, Quiros was driven from Committee to Council and back again. Someone has said that "a committee is a body that keeps minutes and wastes hours." In the 17th century, the Committees apparently wasted years. At last, in order to get rid of him, the government finally gave him permission to go to Peru and undertake another voyage. But a secret letter was sent the Viceroy of Peru telling him to do nothing for Quiros.

He was happy at last when he sailed from Spain and happy still when he reached Panama. Here he died without ever knowing the final humiliation that the government he strove to serve had prepared for him.

WILLIAM CORNELISZ SCHOUTEN (1580-1625) AND JACQUES LE MAIRE

LE MAIRE was a promoter. He wanted to find a new route to India. He had been an original investor and a director in the monopolistic Dutch East India Company, but he had grown to hate its iron-clad rule forbidding independent trading in the East Indies. The penalty was confiscation. Only two routes to the Indies were permitted—through the Strait of Magellan and around the Cape of Good Hope—and those only to members.

As the good burgher Le Maire meditated on these matters, he grew impatient. He decided to discover a new passage to the Indian Ocean and also the rich Southern Continent and thus beat the Company at its own game. Presently he persuaded the townspeople of the village of Hoorn to finance the expedition. It was at Hoorn, on the Zuyder Zee, that Le Maire, a native son of Antwerp, resided with his wife and 22 children.

William Cornelisz Schouten was selected as commander-in-chief, no doubt because of his reputation for having made three trips to India. He was placed in charge of the "Eendracht," and a small yacht, the "Hoorn."

Promoter Le Maire watched his ships sail on June 15, 1615. Two of his sons, Jacques and Daniel, who went in his place, carried his instructions concerning their action in emergencies.

The dullness of the three months' trip across the Atlantic was somewhat enlivened by a bit of carelessness which made a huge bonfire of the "Hoorn." Cleaning operations at the island of Porto Deseado were the immediate cause and everything burned but the guns. These and the men were now welcomed aboard the "Eendracht" and the voyage continued southward. On January 13, 1616, the forbidden Strait of Magellan was off the starboard bow. Schouten no doubt gave it more than a passing look, but the course was not altered. With fine courage they kept on.

Here, condensed from his own journal and in his own seaman's language, is the account of as momentous a week's sailing as has fallen to the lot of marine explorers.

> "Early on the morning of the 24th we sighted land to starboard, lying not more than a good mile away. . . . The land ran east by south with very high mountains, which were all white with snow. We continued to sail along the land, and about noon we came to the end of it and saw more land east of the last, also very high and dangerous looking. These countries lay in our opinion about 8 miles from each other and there appeared to be a good channel between them both. . . . On the morning of the 25th we were close to the more easterly land. . . . We gave this the name of Staten-Landt, but the land to the west of us we called Mauritius de Nassauw. . . . We had a northerly wind to carry us into the channel sailing sou'-sou'-west with good progress. . . . In the evening the wind veered to the south-west and we then ran southward that night with a heavy roll from the south-west and very blue water, from which we opined and were certain . . . that it was the great South Sea, whereat we were very glad, holding that a way had been discovered by us which had until then been unknown to man, as we afterwards found to be the truth. . . . Towards the evening [of the 29th] we again saw land to the north-west. . . . It consisted entirely of high mountains covered with snow, and ends in a sharp corner, which we called the Cape or Hoorn, and which lies in latitude 57° 48′ S."

The strait between Staten Land and Tierra del Fuego was named for Le Maire and the other names given are still on the map. And so they should be to mark the memory of the first sailors round the Horn.

Note that they had good weather and that for their ship the passage was not a slow one at all. Think how many ships have hung off the Horn week after week, beating back and forth, praying for a shift of wind. There is a record of two ships, racing westward around the Horn, held for weeks, beating and beating. Then one ship turns back—"Gives up," the rivals think—and they raise a cheer as they tack ship and try again. In the meantime "the quitter" has passed under the Cape—sailed around the world nearly and come to her Pacific port long before the other ship was by the Horn. Think of the ships lost here between the rocky Cape and the arctic ice—the good ships battered, foundered!

But Schouten came around in fair, clear weather and saw the Cape! Think of that! I have talked with old skippers and seamen who have been round the Horn a score of times and have never even seen the glint of ice on the summit or any land at all.

Their chief purpose accomplished, Schouten kept on toward the Indies and the promise of rich cargoes. He discovered a few islands but these were of little importance—several in the Low Archipelago, and then, on May 10th, a large island which he called Cocos because of its cocoanut trees. The natives at these places spoke no language known to the Hollanders, not even Malay. However, they were habitual thieves. On one occasion they nearly made away with the ship's small boats. In the Ladrone Islands the "Eendracht" was attacked by natives, a fact which gained them the name of Islands of the Traitors.

There being no sign of a southern continent, although they were then 1,600 miles west of Peru, Schouten made an unfortunate decision. He chose to go north to get their exact position, unaware of the fact that Australia was right ahead. The "Eendracht" did not sight Australia but turned northward, visiting several of the Fiji Islands where, it is recorded, the Dutch sailors greatly admired the dancing of young native girls.

Coming at last to the port of Ternate they ran in with a large Dutch fleet under Admiral van Spilbergen. He promptly disbelieved Schouten's story of a new strait. Questions were asked. The Admiral thought they had taken too long to reach Ternate. In short, they were called liars. They had, of course, come through the Strait of Magellan, which was forbidden to any save a ship of the Company, and since they had no right to trade in the Indies the "Eendracht" was confiscated and its men sent home.

It was a bit of bad luck that the Governor-General, Jan Coen, was a stickler for discipline. His predecessor had been known to take a bribe now and then and it was this thought that had prompted the senior Le Maire to instruct his sons regarding such an eventuality. But Coen was not to be bribed. The elder brother soon died of disappointment on the way home, but the younger, when he appeared before the States-General in Holland in 1617, was kindly received and his story heard in full. After a long legal fight, the father recovered his ship and the possession of his papers.

Schouten and Le Maire had indeed discovered a new passage to the Indies. They had done even more from a geographic point of view. They had proved that Tierra del Fuego was not attached to any great southern continent. But the belief that such a land lay nearby continued until the Antarctic journeys of Cook. In the meantime, Tasman, without ever catching sight of it, had completely sailed around the continent we now call Australia.

ABEL TASMAN (1603-1659)

IN 1642, Van Dieman, the Governor-General of the Dutch East Indies, decided that it would be a good thing if more were known of the Indian Ocean. He picked a young Dutch navigator, Abel Tasman, whose reputation for seamanship had been well earned from his early days of poverty and hard work. Van Dieman's instructions to Tasman were detailed and explicit. He wanted to know if Australia was a part of the Southern Continent and if New Guinea was an island. A new route to Chile was to be found. The course to be followed was well off the usual trade routes.

Tasman set sail from Batavia with two small ships, the "Heemskerk" and the "Zeehaen." Franz Visscher, a very able man, was his pilot. They reached Mauritius, as instructed, despite the fact that their ships had been sent out in bad shape by the Batavian government, with the "upper work half-rotten," according to Tasman's diary.

The curious thing about this voyage to learn more of Australia was that Tasman somehow succeeded in sailing around that continent without ever sighting it! Going east from Mauritius they came upon what is now Tasmania, which they named Van Dieman Land. The surf was too high for a boat to be put ashore, so the carpenter swam to the beach. He carried a flag on a pole which he duly placed in the sand on a high point. It was not until the trip of Flinders and Bass in 1798, through the strait which now bears the latter's name, that the separation of Tasmania and Australia was completely proved.

Still farther eastward the expedition sighted land and named it Staten Land, in honor of the States-General. This was in fact part of the South Island of New Zealand—its western coast. Shortly after this Tasman managed to get through the passage between the North and South Islands of New Zealand without realizing it. He continued northeast to the Tonga group (Friendly Islands), then turned west and sailed past the Fiji Islands to New Ireland (Neu Mecklenburg). Tasman thought this place was a part of New Guinea. He then coasted along the northern shores of New Guinea past its western end and thus came back to Batavia.

A second trip, in 1644, was not very successful. Tasman still thought that New Guinea and Australia were one country. However, he did show that the shores of the Gulf of Carpentaria were continuous with those of the northwest and west Australia.

While Tasman's work was not considered profitable by the Dutch, he undoubtedly must rank as one who made a major contribution to the knowledge of geography in the South Pacific. It only remained for Captain James Cook to finish the work Tasman had so admirably begun.

Louis Antoine de Bougainville (1729-1811)

The illustrious Comte de Bougainville was a soldier of France who turned sailor; having campaigned with Montcalm and lost, he made a voyage around the world in search of new lands for his mother country. But these mere facts do not convey his versatility or the scope of his accomplishments. He was possessed of exquisite charm and great learning—a combination which Madame de Pompadour found as unusual among the gentlemen of the Court as it was admirable. At one time a lawyer, a mathematician by instinct, always a superb diplomat, Bougainville was a paragon of all the virtues.

The Treaty of Paris seems to Bougainville a humiliating surrender to the power of England; he is anxious in some way to restore France's colonial prestige. Bougainville, with the aid of rich relatives, undertakes to colonize the Falkland Islands which lie in the south Atlantic eastward from the Strait of Magellan. Beginning in 1764, he makes three voyages to the islands. In the meantime the little settlement of Fort St. Louis thrives under the leadership of Bougainville's cousin, M. de Nerville.

Nothing is overlooked. Bougainville even voyages westward through the Strait of Magellan to establish an amicable relationship between the Patagonians and the Falklanders. The Patagonians are found most amiable. They bring forward their wives and daughters and urge the Frenchmen to embrace them. The savage ladies, having for some reason had their eyebrows plucked in the modern manner, are not hard to look upon. The ceremony of the correct Patagonian exchange of courtesies proceeds to the satisfaction of everyone.

In the meantime the French and Spanish are each making claim to the Falklands which Bougainville has colonized. Faced with rival claims, Louis XV decides to relinquish the Islands to the Spanish. The day comes when Bougainville must return to his beloved St. Louis and relinquish the possession to the Spaniards. Thus, for a second time, Bougainville sees a French colony lost.

He now turns to the sea and conceives the plan of circling the globe. This, by the way, is a year before the first voyage of Captain Cook. In the fall of 1766 the 26-gun frigate "Boudeuse" and a supply ship leave France, headed for great adventure in the South Sea. They carry a splendid company of scientists and learned men.

Both Patagonians and the short, ill-favored savages of Tierra del Fuego are visited this time. The former are found to be very fond of brandy—doubtless because of the cold climate—and, as Bougainville notes, "whenever they drink it, they slap their throats, and roll their lips rapturously, all behaving in exactly the same manner." After 52 days in the Strait of Magellan they enter the broad shining expanse of the South Pacific. The two ships keep far apart, but still in sight of each other. They search for islands but do not see many.

Then, on a clear, sun-lit morning, when the purple sea glitters as with a million dazzling spear-points, they are confronted by the island paradise of Tahiti, with its "peak clothed with trees to the summit . . . a beautiful cascade bursting forth from the mountain-side. . . ." The natives have the unspoiled kindliness of nature. They call "Taio, Taio," meaning "friend." They are beautiful.

The Commander himself says, "As for the women, their appearance ravished the eye and heart, and all their gestures were harmonious. They were not shy and it might fairly be said that Venus was their goddess. Coquettes, like the women of Europe, they ornamented their ears with pearls and with flowers. Sweet idleness is the lot of the women and the art of pleasing their most serious occupation."

The Tahitians are a fine people in every respect save one. They are thieves by instinct, but even in their thievery they manage to be charmingly natural. Not even a social call of some importance is regarded as a closed season. An old native who wants, out of sheer friendliness, to offer his three daughters in marriage, visits Bougainville's cabin. The offer is politely refused. When the family group is gone, Bougainville discovers that his valuable achromatic glass is gone with them. He hastens to send a boat. When the old native sees the pursuers, he turns around, paddles back to meet them and naïvely hands over the precious object.

This idyllic place is called New Cythera by Bougainville and the names of the ships' officers are placed on a parchment in a sealed bottle and buried with appropriate ceremony. Like the English under Captain Wallis, who have already visited Tahiti some months earlier, the French are wholly delighted by its tropical wealth of beauty.

Sailing westward they take with them a young and intelligent native, Autourou, who is later to become a sensation at the Court. They reach the Samoan Islands, naming them the Navigator's Archipelago. Autourou speaks to the natives in Tahitian but they do not understand him.

At the New Hebrides (the Espiritu Santo found by Quiros), Bougainville corrects an error existing for 150 years. He shows that they are islands and not part of the Southern Continent, as yet undiscovered. The long voyage continues. It seems as if they cannot carry on much longer. The food is almost gone. That dread disease scurvy, rages unchecked.

They sight New Holland (Australia) and continue to New Britain which they acquire fo France. A course is set for Batavia past the nort coast of New Guinea and through the Molucc Straits. They are well received by the hospitabl Dutch. The sick are taken to hospitals. All ar sumptuously and frequently dined. Returning at last to his native land and the dignified artificialities of life at the Court of Versailles, Bougainville collates the vast amount of material about his voyage. Two years later he publishes *The Voyage of Bougainville.*

Always gallantly active, this great gentleman and seaman of France, who "belongs to the State, on land as well as on sea," later takes part in West Indian naval campaigns, is found at the King's side in the attack on the Tuilleries in 1792, retires from Paris with his wife and children during the Reign of Terror, is imprisoned. In his old age he graciously receives well-deserved honors from the State and the homage of his people.

It is perhaps most fitting that his name is given today to his discovery of the ardent, graceful, flowering vine of the tropics—bougainvillea.

CAPTAIN JAMES COOK (1728-1779)

IN 1769 the planet Venus passed across the face of the sun, and scurvy, which had been the scourge of seamen for thousands of years, was conquered.

We might suppose at first that only an astrologer would care to connect these events. Yet the connection was real and close. The man who made it so was Captain James Cook.

Cook took a party of English scientists to the Pacific to observe this transit of Venus. He put the first ring around the Antarctic Ocean. He showed that the great Southern Continent was not where it was supposed to be. He searched out almost every island group and corner of the vast Pacific Ocean but in the end the thing of which he seems to have been most proud was the fact that he sailed many months at sea without ever losing a man from scurvy.

James Cook was a stalwart man of austere but striking countenance. His father was an agricultural laborer and the boy rose through hard work to become master of his own ships in the Royal Navy. As the saying goes, "he came aboard through the hawse hole," and won his command, and did so without arousing rancor or seeming out of place in an environment created by gentlemen.

The expedition left England in the "Endeavor" (370 tons), Captain Cook commanding. Sir Joseph Banks headed the eminent scientific staff. Passing through the Straits of Le Maire and around Cape Horn, the "Endeavor" came to Otaheite in the Low Archipelago where the transit of Venus was successfully observed on June 3, 1769, while the thermometer read 119 degrees.

Cook soon began his extended voyage. He first visited the Society Islands, then journeyed to New Zealand, sailing completely around both the North and South islands, thus finally proving their insularity. The task would have discouraged anyone less persistent than Cook. It needed more than half a year and 2,400 miles of coast line were painstakingly charted. They had visual proof of cannibalism among the Maoris and were unable to explore the interior because of hostile natives.

Cook was aware of the existence of New Holland; he sailed westward and discovered its eastern coast, which he then followed to the north. This coast he named New South Wales. Botany Bay was so named because its numerous flora gave the botanists in the party a busy season.

The "Endeavor" passed along the barren shore of Australia, often observing smoke signals but seeing few natives. Aside from the numerous kangaroos, Australia provided little of interest until June 10th, when the "Endeavor" was leaving a bay north of Cape Grafton. The leadsman called back "17 fathoms" and instantly the ship piled up on a coral reef. It was almost the end, but frenzied pumping and the quick-witted suggestion of Midshipman Monkhouse that the ship be "fothered"—or blanketed across the leak—enabled them to get to a river where she was safely beached. They repaired the damage and set out for New Guinea and Torres Strait. Again they came within a few yards of complete disaster on the Great Barrier Reef.

Up to their arrival at Batavia, Cook had not lost a single man through sickness. He could take care of his men and protect them from shipwreck and sickness as long as they were aboard. But Batavia proved a death-hole of fevers. More than 30 died here.

Cook's determination to conquer scurvy was a natural result of his early sea experience when he often saw half and more than half of a ship's company die of this loathsome disease. He made it a habit to inspect the ship himself. He insisted on cleanliness. The vessels on which he sailed were often fumigated and washed down, fires being lighted afterward to dry out the holds and quarters. The strictness of his inspection made one writer comment that "every day was Sunday aboard of Captain Cook."

But the all-important anti-scorbutic measure was the diet which was strictly enforced. It included "Sour Kraute, Mustard, Vinegar, Wheat [whole], Inspissated Orange and Lemon Juice, Saloup [made either from roots of a meadow plant or from Sassafras, a drink popular before the introduction of tea or coffee], Portable Soup [in appearance a cake of whiteish glue], Sugar, Molasses, Vegetables." In addition, white celery was collected as often as it was found and a fresh wort was made from malt.

The "Endeavor" left Batavia and sailed for home, arriving in July, 1771. Aside from his remarkable health record, Cook's first voyage achieved several valuable conclusions—proof of the insularity of New Zealand, formerly believed part of the Southern Continent, and a definite limiting of the area where such a continent might be found, if it ever was.

A second voyage left England in 1772, with Cook in command of the "Resolution" (462 tons) and Mr. Furneaux of the "Adventure." Passing the Cape of Good Hope, they steered southeast and crossed the Antarctic Circle in January, 1773. There was no sight of a southern continent, although they had dangers and hardships enough by reason of ice fields and icebergs. At New Zealand a rich supply of scurvy grass was found. This was boiled with wheat or pease and potable broth and eaten twice daily, a boon at that time because some of the men were very sick. Crossing to the south and again westward Cook was more than ever convinced that there was no southern continent. He then made for Easter Island, the Marquesas and back to Otaheite (Tahiti).

Later the "Resolution" came to Espiritu Santo, which Cook renamed New Hebrides, and from there they went southwest, reaching a new and large island named New Caledonia. Thi place, Cook notes, was remarkable as being the only island in the Pacific where the natives wer not thieves.

The return voyage to England in 1775 wa by way of New Zealand, Cape Horn and th Cape of Good Hope, again without a single los of life from scurvy. He had made several new discoveries and traversed both the Pacific an the Atlantic from west to east in southern latitudes. The trip totaled 20,000 leagues, or three times the earth's circumference, and lasted three years. For this achievement Cook was made Post-Captain in the Royal Navy and elected member of the Royal Society.

The very next year a third expedition wa undertaken to find a northern pass from th Pacific to the Atlantic. Cook again sailed in th "Resolution," accompanied by the "Discovery. Both ships proceeded to Tasmania by way of th

Cape of Good Hope and then went on to New Zealand, the Tonga and the Society islands. On his northward journey, Cook rediscovered the Hawaiian Islands, or Sandwich Islands as they were named in honor of Lord Sandwich, Cook's friend and patron. A survey of the west coast of North America, as far as Icy Cape (Point Barrow) in extreme northwest Alaska, was followed by a visit to the Asiatic shores of Bering Strait. The ships returned to the Yukon and so southward again to the Sandwich Islands.

It was here that the natives stole the "Discovery's" cutter and finally brought to a head the strained relationships caused by endless pilfering. An attack was precipitated in which Captain Cook was killed. On receipt of the news of the cutter's theft, Cook had gone straight to the chief, Torreeoboo, whom he found in no way responsible. The tension was considerably lessened until word arrived that a chief had been killed by one of the searching parties. Cook was forced to retreat to the beach under a guard of marines. The natives got out their war mats, which served as a fair protection against the English musket-fire, and started a furious attack with stones and spears. When they got to the water, Cook, who was covering the retreat of his men, faced seaward to call a command to a near-by boat. That moment proved fatal. He was struck on the head and stabbed in the back. He fell dying into the water and was carried off by the natives.

For several days his companions had no news of him. Then, at last, a party of natives headed by a chief returned to the ships bringing with them the bones of James Cook. On the 21st of February, at sunset, the "Resolution" fired ten minute-guns, with the colors half staff up, and the remains of their late commander were committed to the deep.

Captain Cook was unquestionably the greatest explorer of his century. He was in every respect a leader among men, worthy of far greater honor than was accorded him in his lifetime by his mother-country. It is indeed a tragedy that the man whose travels brought joy and many benefits to the lives of the South Sea natives should have been murdered by one of those he desired to help. Kindly, yet severe, eminently just, a man of boundless activity, James Cook is now, as he was then, a model of British seamanship and fortitude.

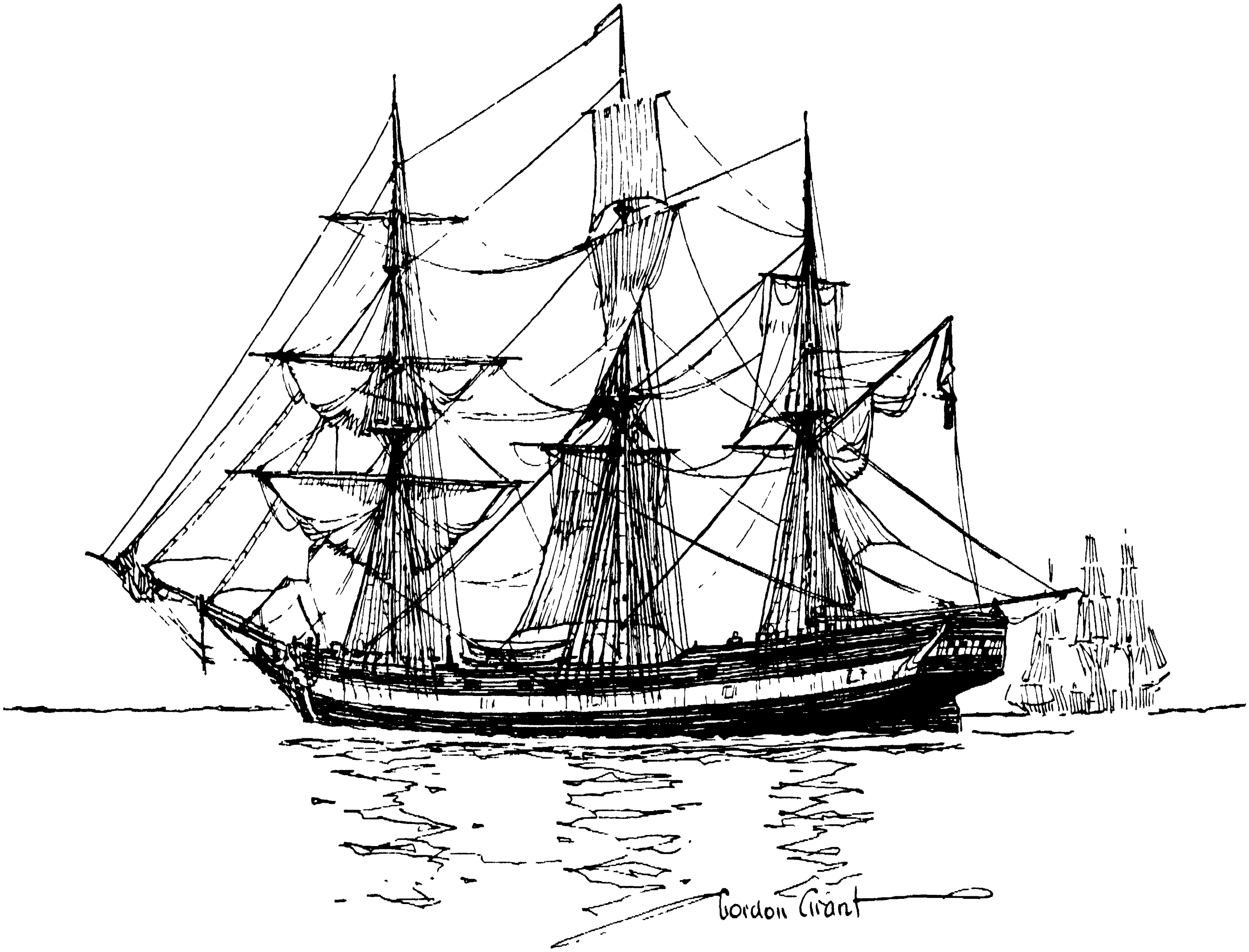
JEAN FRANÇOIS DE GALAUP LA PÉROUSE
(1741-1788)

TO the French naval officer, La Pérouse, fell the task of completing the work of Cook. To be sure there was not much that Cook left unfinished, but the French government mapped out a most ambitious program for their luckless navigator. His activities were to cover the entire Pacific area.

La Pérouse was fortunate in inheriting the scientific methods that had been evolved by the incomparable Britisher. He had the good sense and the ability to adopt them in large measure and was accordingly able to carry on without fear of scurvy and, thanks to a large and competent scientific staff, with attendant success in the field of research.

When La Pérouse sailed from Brest in 1785 he was 44 years of age and had achieved an admirable record of service in two naval wars. His humane disposition was well known. Sent out to destroy the English settlement at Hudson Bay in 1781, he carried out his orders to the letter, but not until he had left arms and food for the inhabitants who fled to the forest.

Two frigates, the "Boussole" and the "Astrolabe," with crews and staffs totaling 223, made up the Pacific expedition. Rounding Cape Horn, La Pérouse set his course for Easter Island.



COOK'S SHIPS: THE "ENDEAVOR BARK" AND "RESOLUTION" AND "ADVENTURE"

THE "Endeavor Bark" is one of the most famous of the ships of exploration. She and her successors, the "Resolution" and "Adventure," were used by Cook on his three voyages of discovery. These vessels were all built as colliers at Whitby. Their plans are preserved in the Admiralty offices and form the basis of our present acquaintanceship with this type of vessel. The colliers were bluff in the bows, broad in the counter and full in the bilges. In all these respects they differed from the smarter merchantmen and naval vessels. The ships were acquired by the Navy for Cook's particular use. Their sturdy build, their great capacity for stowing and carrying provisions and equipment, served his purposes well. Speed under sail was not an important characteristic on such long voyages of exploration as Cook carried out. The full and simple lines and the strong structure were a great advantage when he encountered ice in the Antarctic.

The vessels were called "barks" because this describes the character of their hulls. Originally they were probably bark-rigged, that is, they carried no square mizzen-topsail But after they joined the Navy and came into Cook's hands, they were rigged as "ships." Only a heavy and honestly built vessel could have survived the terrible adventure when the ships were caught on the Great Barrier Ree of Australia. Only extraordinary seamanship, ingenuity and courage could have pulled a vessel through such experiences.

From there he went to the Sandwich Islands and crossed to the North American coast at Mt. St. Elias. After a coastal voyage southward to Monterey, he sailed west again, passing to the north of the Sandwich Islands to Macao and from there went to the Philippines.

Then, in 1787, he began his surveys on the Asiatic coast. The ships passed Formosa, the Lu-chu Islands, Quelpart Island and went through the Korean Strait and the Sea of Japan to the Gulf of Tartary, which separates Sakhalin from the mainland of Manchuria. Shortly afterward he proved the insularity of Sakhalin and passed through the strait which now bears his name and divides that island from Yezo on the south. Traveling through the Kurile Islands he came to Kamchatka where he forwarded a report of his findings to France by way of Siberia. He next decided on a southerly course and journeyed through the Navigator's and Friendly islands to Port Jackson, arriving there in January, 1788. A short time after this he left Botany Bay, Australia. His ships were never seen again.

A searching party was dispatched but was obliged to return unsuccessful after two years of cruising through the islands. A number of conflicting conjectures were made but the best evidence seems to point to the conclusion that both ships were wrecked off the island of Vanikoro in the Santa Cruz group. Some believed that La Pérouse and his men had been murdered by natives, but the proof that was finally accepted by the French government as authentic came from an Irishman named Dillon who was a mate in a small boat in the sandalwood trade. Dillon found a number of relics resting in shallow water off the shore of Vanikoro and returned with them as evidence of the disaster which had overtaken the ill-fated La Pérouse.

AUSTRALIA

WHILE the actual discovery of Australia is shrouded in the vague claims and counter-claims of several 16th century voyagers, there is evidence that the Chinese and also the Malays had some knowledge of this land three centuries earlier. The imaginative and much-traveled Marco Polo also had some thoughts on the subject.

As the attention of the Old World fastened on the New and what might lie beyond it, the tradition of Terra Australis grew to an imposing stature. King and commoner alike believed in the existence of this southern land which the Dutch historian, Wytfliet, in 1597, expected would prove equal to one-fifth of the earth's surface.

The first definite claim to discovery of the southern land, or Australia, came from the French in 1503. One Binot Paulmyer, sieur de Gonneville, had been forced by a storm to land on a large island. Whether it was Australia or Madagascar is still an open question. Again, in 1531, the French Provence navigator, Guillaume le Testu, returned with a story of having sighted the continent. The Portuguese also claimed the honor. The circumstantial evidence was so nebulous that it did not provide grounds for a good argument.

The slow, piecemeal discovery of the great Australian coast line probably began with the voyage of Torres through the Torres Strait to the Philippines in 1606. It is more than likely that Torres sighted the northern coast. From that year until 1665 the Dutch were responsible for the first accurate knowledge of the north and west coasts of what they later called New Holland. In these pioneer voyages we find the names of Hartogszoon, Pool, Nuyts, DeWitt and Pelsaert. The first definite knowledge that Europe obtained of the nature of New Holland was from Pelsaert—and it was not at all complimentary. Pelsaert had been through a mutiny and when he saw the sparse, inhospitable coast, populated chiefly by "large jumping raccoons," he felt swindled.

Meanwhile, Tasman had discovered Van Dieman's Land, now Tasmania. In 1688 the "Cygnet," a trading vessel whose crew had turned buccaneers, sighted the Australian coast. On this ship was the Englishman Dampier who some ten years later went out again and explored 900 miles of the shore from Shark's Bay to Dampier's Archipelago and from there to Roebuck Bay. He, too, sent back a disillusioning account of the country. The last chapter of coastal exploration was written by that great English navigator, Captain Cook, who accurately charted the entire east coast on his first voyage to the Pacific.

By this time settlers had arrived on the southeastern coast and there commenced the general exploration of their continent. The first period of this series of exploration revealed the coastal areas of the continent and extended to the year 1857. It commenced in 1798 when George Bass and Captain Matthew Flinders in a small boat made a trip along the coast from Port Jackson and entered the strait between Tasmania and Australia. Later in the year in a larger boat, a sloop, they sailed through the Bass Strait and round Tasmania. In the early years of the 19th century Flinders continued this work with an examination of the south coast. On this trip he met with a Captain Baudin, a French navigator, who was passing along the coast from the west. In 1803 Flinders circumnavigated Australia, his voyage including even a survey of the Gulf of Carpentaria.

The first 30 years of the 19th century were occupied with a number of minor explorations which, spreading from the settlements on the eastern coast, gradually penetrated the coastal mountain ranges and, beyond the passes, followed the river systems that ran to the west and south. During this period John Oxley made a number of pioneer trips into the interior. He was followed by Hume, Hovell and others. It was, however, Charles Sturt and Major Thomas Mitchell, commencing their work in 1828 and 1831, who added most to this period of exploration. In the years of their first travel there was a serious drought and the task of finding water and new range spurred their activity. In 1828 Sturt followed the River Macquarie beyond the point reached by Oxley and eventually followed it into the Darling River, which proved to be an outlet for two of the streams that Oxley had reported.

Sturt's next attempt was made in the following year. This time he started from Sydney and went to the headstream of the Murrumbidgee. Here he launched a boat and boldly started down the river, which he followed to its confluence with a stream flowing in from the north. This he rightly guessed was the Darling River. He continued to the mouth of the Murrumbidgee at Encounter Bay. Here he turned about and made a difficult and tiring journey up the river and from its headwaters crossed to Sydney. Sturt's final trip was made in 1844, when he set out from Adelaide, moving into the interior by the Murray and Darling rivers. He then moved in a northwestern direction across a region which he called the "Great Stony Desert." He crossed Strzelecki Creek and Cooper's Creek and penetrated well into the central Australian area.

In the meantime Dr. Ludwig Leichhardt greatly extended exploration in the northwest quarter of Australia. He began in 1844 at Moreton Bay in the center of the east coast, went to the headwaters of the Condamine River and took a north-northeast direction which carried him parallel with the northeast coast. He passed along the Burdekin River and down the Lynd and

Mitchell rivers to near the eastern shore of the Gulf of Carpentaria. He passed round the Gulf and continued to Port Essington on the extreme northern coast. He added many rivers and mountains to the map of Australia and traveled in all about 3,000 miles. Two years later he tried to cross Australia from east to west but was never heard from again.

In 1855 A. C. Gregory, starting in north Australia on the Victoria River, skirted the Gulf of Carpentaria on a route very similar to that of Leichhardt. Also, together with his brother, F. T. Gregory, he carried out a number of explorations in the west, making circuits northward from Perth. F. T. Gregory followed the courses of the De Grey, Fortescue, Lyons and Gascoyne rivers.

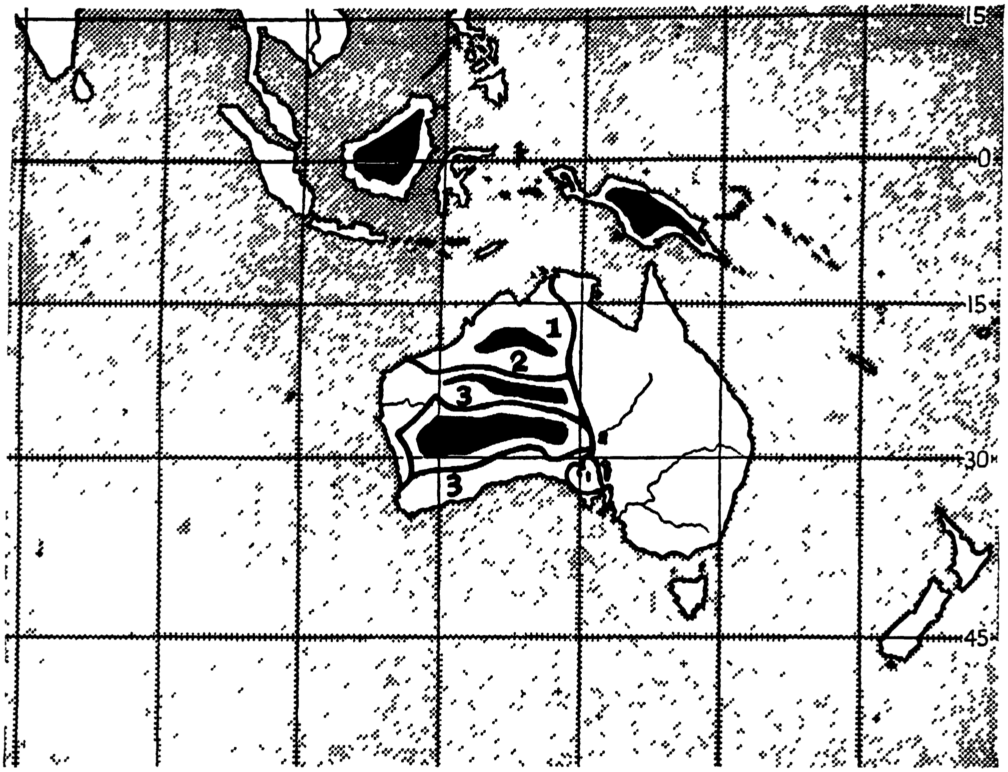
E. J. Eyre in 1839, starting from his sheep ranch 150 miles north of Adelaide, explored the Flinders Range, climbed Mount Eyre and saw Lake Torrens. He also explored the Lincoln Peninsula. In 1841 Eyre determined on a western journey. Accompanied by John Baxter and three natives he started from Mount Arden at the head of the Spencer Gulf and went to Streaky Bay. He had limited provisions and equipment and was undoubtedly rash in determining to follow the south coast of Australia around the Australian Bight. Guided by his determination, however, the party pushed on, and passed Fowler's Bay. Provisions dwindled rapidly and 600 miles of unexplored coast lay before them. The party suffered greatly from thirst and hunger and after a few weeks Baxter was murdered by two of the natives, who fled. But Eyre still pushed on until his supplies were completely exhausted. Fortune, however, was kind to him and he succeeded in signaling to a ship that was passing offshore. Meeting the ship broke the loneliness of his solitary travel, gave him a rest and renewed his provisions. Thus fortified, he continued his trip, reaching at last Albany on the southwest coast. He had thus succeeded in revealing the difficult and forbidding character of the south Australian coast and in linking up the settled areas in the east with those in the west.

It will be seen that in general up to 1857 knowledge of Australia was confined to the coast line and to some of the nearer and more accessible rivers. Exception, however, must be made to the territory of southeastern Australia, which had been crossed in many directions and was already supporting a large pioneer population. The interior was known in a very limited fashion through Sturt's last journey. The combined explorations had, however, given an understanding of the important characteristics of the outer rim of the continent. The great arid central plains and deserts of the continent remained untraversed and unexplored. It was this type of exploration that was left for the Australian travelers after 1857.

The first crossing of Australia from south to north was made in 1860 by R. O'H. Burke and W. J. Wills on an expedition so extraordinary that it is worth recording in some detail. The expedition was unusually elaborate for that time in Australia and was fitted out at public expense. It was even supplied with a caravan of camels imported from Peshawar in India, also with horses and ample provisions.

They left Menindee on the Darling River in October, moving north in grand style. Unfortunately, however, the wrong man appears to have been put in command of the expedition. Burke was a police officer of great energy but he was rash, impatient and had little fundamental knowledge of travel in the bush. Wills, who was second in command, was the astronomer and scientific observer. He appears, however, to have been able to do little more than keep up with his frantic leader.

At Cooper's Creek in the interior Burke decided to make a dash for the Gulf of Carpentaria,



AUSTRALIA AFTER 1860

(1) Stuart across the continent, south to north—Adelaide to Port Darwin, 1862 (2) Warburton Alice Springs to Roeburn on the west coast, 1873 (3) Giles Port Augusta, Perth, Fortescue River, Oodnadatta, 1875

taking with him King, Wills and Gray but leaving the other members of his party at a depot here. They took with them six of the camels, two horses and enough food for three months.

Again the party went northward at great speed but with much fatigue to the men and serious strain on all their animals. The camels cut their feet on the stony ground and the horses sank in the mire and boggy patches. They had left the region of the Barcoo in November, 1860, and they arrived on the estuary of the Flinders River in the following February. Little real exploration was carried out. Burke did not even push on to the actual Gulf but simply made sure he had reached the estuary and then turned about and started back again with great speed and determination. Soon the horses were badly crippled and the camels exhausted. Gray, one of the members of the party, was seriously ill and protested that he was unable to move. No particular effort was made to slacken the pace or to relieve the sufferer and he soon died.

They arrived back at Cooper's Creek only to discover that Brahe, who had been left in charge of the camp, had grown tired of waiting and had departed the day before the arrival of Burke's party. Brahe had left behind only a small cache of food. This was a serious blow, for both the men and the beasts were now in a very depleted condition. Even Burke's impetuosity was beginning to wear out. On Cooper's Creek he left a note at the camp with the following postscript: "The camels cannot travel and we cannot walk or we should follow the other party. We shall move very slowly down the creek."

They started off, only to find that the two surviving camels had to be shot. The dried camel meat served them for provision for a short while.

For some weeks they fell in with friendly blackfellows, but the friendship soon wore off, for the white men ate too much. They could not subsist on the meager diet of the Australian natives who finally went off and left the white men to shift for themselves. Wills, the scientist, was now starving to death and was left behind to die. Burke and King pushed on but the second day after Wills had been abandoned Burke himself dropped on the trail and died during the night. King was facing almost certain death when Australian natives found him and fed him.

In the meantime, concern had grown over the fate of the Burke party. A number of relief parties were sent out in various directions. A. W. Howitt reached Cooper's Creek and rescued King. Burke's expedition really added very little information about Australia and it was only its sensational character that attracted attention, but the relief parties that were sent out spread broadly over the land and brought back reports about a number of new regions.

J. M. Stuart in 1860 commenced a more serious exploration of central Australia with the intention finally of making a complete transcontinental journey. On his first trip he started from Adelaide, passed round Lake Eyre by the west, discovered and named the MacDonnell Mountains. Farther north he discovered the solitary, central mountain which is now named Mount Stuart. A journey in 1861 carried him still farther north, but he ran short of provisions and of water and had to return. His third and successful trip was made in 1862. This brought him out by way of the Adelaide River at the extreme north coast.

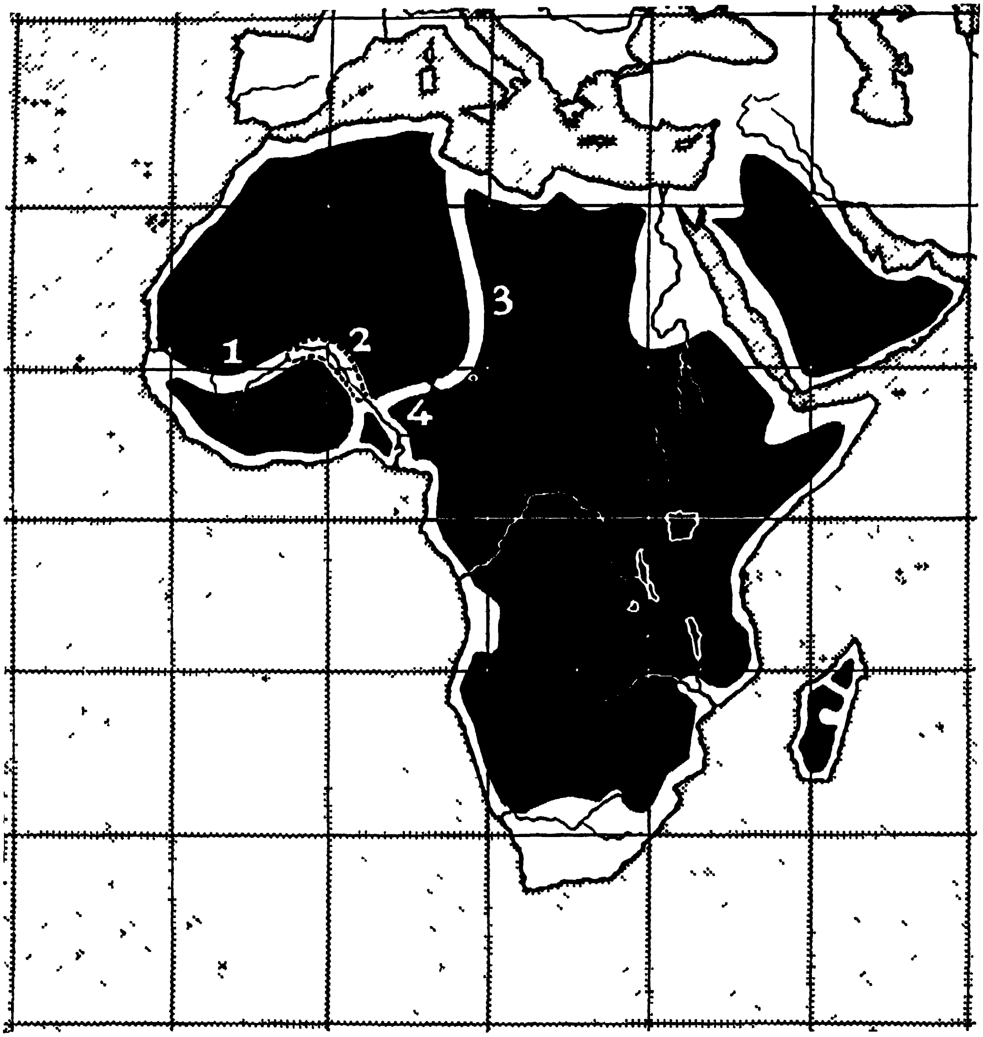
In 1874 J. Forrest crossed the great central desert from west to east—a feat similar to that which had just been accomplished by P. E. Warburton who had traveled from the centrally located Alice Springs westward to the coast. Giles was the third adventurer to make such a crossing.

It might be said that the year 1875 marked the end of pioneer days in interior exploration. Although many small sections were still uninvestigated, the general features of the continent were pretty accurately charted.

Exploration on a minor scale has gone on in Australia up to the present time and scientific surveys are still in the process of development. In the arid, west-central portion of the continent areas, which would have received relatively little attention, were suddenly flooded with prospectors and settlers when gold-bearing reefs were discovered here in the last decade of the 19th century. Within the last four or five years the discovery of gold in paying quantities in a reef located almost in the heart of the continent amid a desert led to a sudden gold rush to this region, so that many of the features of the pioneer days in Australia were repeated, including brushes with natives who resented the white man's intrusion. Such gold rushes lead in time to better maps and to an increase in knowledge of all surrounding areas. In this case some new features were added to pioneering life: a postoffice was established at the reef and an airplane transport service ran to it from Alice Springs. It has been reported that even water was brought into the region by airplane.

PART VIII

AFRICA



THE NIGER, 1795-1831

(1) Park, 1795-1797 (2) Park's second trip, 1805 (3) Clapperton, Denham and Oudney, 1823-25 (4) Lander, 1825-1831

AFRICA

THE whole interior of the African continent remained a mystery until the 19th century. At the beginning of that century European science knew little more about Africa than the classical scholars had known. Indeed, some things that Herodotus and others had reported were forgotten or distrusted. Knowledge of the coast of Africa had of course increased. The Portuguese had developed the sea route to India and in this process had put down shore stations and colonies. Also, in Portuguese East Africa missionaries had made journeys up the Limpopo River. The development of the slave trade and trade with the African interior had brought the European nations into contact with the West Coast. The French held Senegal and made some attempts to develop it. Slaving stations of English, French, Portuguese and Spanish were established along the Gold Coast, the Ivory Coast, the Bight of Benin and the Congo. The English had acquired a knowledge of Egyptian territory and an English explorer, James Bruce, had made a voyage through Abyssinia and had followed the course of the Blue Nile in 1770-1772.

In terms of the maps we are using we may say that up to the close of the 18th century there was only a white rim around Africa and that the dark interior lay unknown and unguessed.

It is not difficult to explain this, for the rest of the world had been developing very rapidly and had absorbed the attention of Europe and even of America. The discovery of the New World had distracted interest from the Portuguese route about Africa. Attention was turned to the wealth of the new continent and to alternative routes of reaching the Pacific and the East. Europe also had learned to think of Africa solely in terms of the slave trade. African slavery had begun when the captains sailing under Henry the Navigator brought their first captive back to Lisbon. The rapid extinction of the Indians in the Caribbean and the need for labor to replace them introduced profitable slave trade between Africa and the American continent, which went on for over three centuries.

The first evidence of concerted interest in the geography and commercial possibilities of Africa came in 1788 when the African Association was founded in London. The Association's early efforts were attended with uniform and signal failure. John Ledyard went out at once with the object of crossing the desert between Egypt and the Niger River. He did not even have an opportunity to commence his journey, for he died in Cairo.

Lucas, who went about the same time, was to attempt a crossing of the desert from the north, but he got no further than collecting some information about the trade routes from Morocco and Algiers. A year later Hornemann tried again from Egypt, reached Murzuk, and came out by Tripoli. Major Houghton made an attempt on the interior through Gambia but was murdered. Then, in 1795, the Association turned to Mungo Park.

MUNGO PARK (1771-1806)

MUNGO PARK was a Scotch physician, 24 years of age, when the African Association turned to him with a startling and romantic problem. He was requested to enter Africa, to find the River Niger and to explore its course. That the river existed everybody knew, but the geographers of the time were actually uncertain where it arose and where it reached the sea. It was not even known whether the river flowed east or west. Herodotus and Ibn Battutá had of course reported that the river ran eastward, but their evidence was discredited. There even lingered at this time a remnant of the old tradition which held that the Niger was only a westward extension of the Nile. This was the chief riddle Park was to solve, but it involved the settlement of a prior problem. Nobody knew how to travel successfully in Africa, and there was already a sad record of failures. Four expeditions had terminated fatally or futilely.

At the time Park set out he had not the slightest acquaintance with Africa. His only experience in travel had been a voyage made to the East Indies, on which he served as surgeon and had an opportunity for becoming interested in the study of geography and natural history.

But the man whose name was to become a household word in England and who was to arouse Europe to an interest in a new continent was not daunted by his lack of experience. Indeed, the uncertain character of the whole undertaking aroused his passionate interest. In the spring of 1795 he sailed for the Gambia and proceeded directly to Pisania, where he devoted himself to learning the Mandingo language and to becoming familiar with African customs.

With a Negro servant, Johnson, who could act as interpreter, and with a boy, Demba, whom he later called his "faithful boy" and who through a succession of great hardships fully deserved his title, Park left Pisania in December of 1795. Accompanying them were some native travelers going on their own special errands. Park had a horse for himself and two asses for his interpreter and servant, his followers and the baggage. His equipment was light, not to say scanty. For trade-goods he had amber, beads, tobacco. He took with him a few scientific instruments—that is to say, a pocket sextant, a magnetic compass, and a thermometer. For arms he had two guns and two pairs of pistols. He carried an umbrella.

At Medina, the local king, who knew of Major Houghton's fate, tried to dissuade him from the trip but Park continued. As he advanced he had to change guides occasionally, for he was moving into territory that was more forbidding and hostile. He continued as long as he could in the forested region, that is where there were heathen and purely African tribes. But the Niger, which he was seeking, lay northward, that is where the deserts encroached and where a wild and fanatical Mohammedanism held sway. His experience with the purely African peoples was embarrassing and entertaining rather than dangerous. At Fatteconda the king took Park's only coat away from him because he admired the yellow buttons. The ladies of the court joked about the color of his skin and the shape of his nose. When Park praised their black skins and flat noses politely, they informed him that honey-mouth (flattery) was not esteemed in Bondou.

The comedy was over when he advanced into Moorish territory. At the first watering place they were robbed by the Moors. His attendants, finding he was powerless, began to desert him. He went on alone at night with wild beasts howling about him. But the "faithful boy" soon rejoined him.

At Samee Park was thinking that he was free of the Moors and was looking forward to rapid progress toward the Niger when suddenly they invaded the hut and dragged him off to their chief, Ali, at Benoum.

Here Park was again an object of curiosity. The whole encampment turned out to look at this strange creature. They pulled at his clothes and twisted his hat about and pushed and prodded him. The buttons of his clothes were a particular curiosity, and he had to demonstrate their use by dressing and undressing, to the great delight and merriment of the crowd. His clothes, his instruments, his horse—in short, all his possessions—were removed from him and he was kept in confinement while a council decided his fate. Reports reached him of this council. He was to be put to death. His right hand was to be chopped off. Ali's son sneaked to him with the information that they were going to put his eyes out. Finally Park was told that he was to be kept waiting until the arrival of Queen Fatima. In the meantime he was half-starved and poorly treated and at one time was even confined in a pig-pen.

Park finally escaped from the Moors at Queira, which they reached in their nomadic wanderings. Johnson refused to travel farther with Park and the explorer gave him letters to carry to Gambia. Park had few clothes and provisions and no money or trade-goods. Poor as he was, he proceeded only a short way before he was overtaken by three Moors who robbed him of his cloak. He survived a sandstorm and a violent rainstorm. The rain permitted him to relieve his great thirst by sucking water out of his clothes.

Leading his exhausted horse, Park plodded on driven by fear. For years the horror of his experiences among the Moors clung to him and became a recurring nightmare and obsession.

He came to a Negro village at last, and here a poor woman shared her meager supplies with him. Thus he went on from town to town, living on the hospitality of the friendly Africans. Park joined two Negroes who were going to Segu. He was able to purchase food for himself and corn for his horse by offering a button cut from his clothing. He had now come to a country where travelers on the road were frequent and towns nearer together.

On July 21, 1796, Park and his companions came out on the brink of a large river which flowed slowly to the eastward. This was the Niger, or, as the Negroes called it, the Joliba, "the great water." This was in the country of the ruler Mansong who refused to receive Park but who generously sent him 5,000 cowrie shells to assist him in his journey. From Segu, Park started for Jenné and also considered going to Timbuktu but he discovered in time that these towns were both in control of the Moors. He was suffering from hunger, extreme fatigue and fever. Despite the King's gift, he was still in a poverty-stricken condition. He had questioned merchants who had traded to the eastward and they described a lake and some features of the river beyond this. They said the distance from Jenné to Timbuktu was a twelve days' journey. But beyond— "Who knows where the river runs? Probably it runs to the world's end."

Park decided that nothing further was to be gained on that trip—in fact, that it was impossible for him to proceed and that he would be lucky now to make the return journey. He started westward at the end of July, recovered the horse he had lost, only to be robbed of it and of his compass and of everything else except the notes of his journey which he carried in his hat.

At Sibidooloo he came to the country of a friendly chief where he was forced to wait some months for the traveling season. Finally he started for the coast with a slave coffle and reached Pisania to find that his messenger, Johnson, had never returned and that he himself had been given up for dead. An American slaver, the "Charles-Town," had come poking up the river after a cargo of blacks destined for South Carolina. Park took passage on her, not knowing at what rare interval an English ship was likely to reach this coast. He reached England just in time for Christmas in 1797.

The African Association was more than delighted to see Park return safely. He wrote a report and a book, both of which were received with acclaim. Park had succeeded in determining the direction and flow of the Niger River and had indicated the position and character of its upper course. More than this, he had given Europe its first complete and authentic picture of the interior of West Africa—a vision of the great forests and deserts, the exotic foliage, the pestilential climate, the system of trade by barter, the multiplicity of the African tribes, the savagery of the Moors, the endless vicissitudes and difficulties of travel. Many of these features of an African journal were to be repeated with minor variations by countless travelers, hunters and adventurers. But it was through Park that they were first made known. He became and remained "Park, the great African traveler."

Park married and settled down to the practice of medicine in a Scotch town but he kept hoping against hope for an opportunity to return to Africa. Finally, after negotiation and delay, in 1805, by an arrangement with the Colonial Office he was able to resume his travels. The expenses for his first trip had been £200. Now he was granted £5,000 and the assistance of a considerable party. Dr. Alexander Anderson, surgeon and Park's brother-in-law, was second in command. There were boat builders and other workmen included in the party, for it was planned that they should navigate the Niger as far as possible.

The party proceeded to Gorée. Here they collected troops to the number of 35 who were promised double pay and discharge on their return. These were all volunteers. A Lieutenant Martyn of the artillery also volunteered and was accepted. Two sailors were taken from the frigate to assist in the building and the sailing of the boats. Altogether, when contrasted with Park's solitary trip, it was a party with considerable resources.

With this party Park proceeded from Gorée up the Gambia near to Pisania, from where he had started ten years earlier. It was now April, the least favorable season for African travel. The troops were not well trained and not in good condition for strenuous travel. Park however was impressed with the size of his party and the responsibilities that now devolved on him, and he felt he could not face six or seven months' delay which would have been necessary to bring him into the proper season for travel.

He pushed off through the forest with his men and a Mandingo priest by the name of Isaaco, who served as interpreter. Forty-four asses had been purchased to assist in the transport. These animals delayed progress quite as much as they assisted it. They kicked off their bundles, they stuck in the mud and lay down on the road.

By the early part of May two of the soldiers were already suffering from dysentery. In the middle of the month they crossed the Gambia with considerable difficulty. However Park was hopeful of the expedition and wrote confident letters home. But in several ways his conduct of the expedition reflected a change of attitude in him since his first trip, and it is possible that he was already exhibiting the effects of mental and physical strain. He was less patient, less conciliatory to the natives, a little more inclined to rush things and to depend upon the backing of his troops.

Then the rains hit them, and they suffered from tornadoes as well. Park pushed on but was now forced occasionally to leave behind him men who had fallen ill and were no longer able to face the trail. Sometimes they would fall and beg to be left behind. Park attended carefully as many as he could take care of. Some he left in charge of the headman of the village, leaving bars of amber and other trade-goods as compensation. In July, Anderson and Scott became ill The guide, Isaaco, was attacked by an alligator in a creek and was severely injured and only escaped by gouging the animal's eyes out. Park himself was sick and groggy. None the less he pushed on, with his party constantly growing smaller in numbers and feebler in strength and resistance. At this stage of the trip the party was so hurried and so feeble that it pushed on without stopping to bury its dead.

It was mid-August before he and his little band succeeded in climbing the mountain range which separates the headwaters of the Senegal from the course of the Niger. Here he had his second view of the great river. He came down from the hills and pitched camp near Bambakoo. Of 34 soldiers and 4 carpenters who had started out, there were left 6 soldiers and 1 carpenter.

After some slight rest they started down the river in canoes. Park was now in the territory of Mansong, the chief who had assisted him on his earlier expedition. He succeeded again in getting from him a promise of freedom of movement and some protection. Finally, by attaching together the pieces of several old and rotten canoes and by making additions of their own, they succeeded in creating a vessel which Park christened "His Majesty's schooner Joliba." In the meantime Park had been carrying on a trade with the natives and had aroused the jealousy of native traders. To add to the difficulties, Anderson died after a continued illness of four months. Mansong urged Park to depart before the Moors down the river heard of his intended journey.

In the middle of November, Park concluded his journal with a description of their preparations for departure on the "schooner" and sent a letter to the Colonial Office. Isaaco delivered the letter and journal at Gambia. Park pushed off down the river and for years the letter and journal were all the evidence that Europe had of his progress. Park had disappeared into the black heart of Africa! For a while there was expectation and hope that he would emerge suddenly at some outpost. As time went on these hopes began to dwindle. In the succeeding years they were replaced by rumors that Park had been killed, but there was no definite confirmation and no concrete evidence of his fate. In 1810 Colonel Maxwell, governor of Senegal, summoned Isaaco and sent him to the Niger to bring back what definite news he could. Isaaco's journal of his travel is in itself a minor epic. He located Amadi Fatouma, a guide who had joined Park on the voyage down the river.

According to Fatouma's account, there were with Park, Lieutenant Martyn, three white men, three slaves and Fatouma himself. They went down the river past Jenné, through the widening of the stream that forms Lake Dibbie and swept on past the port of Timbuktu. They were now entering Haussa territory where Fatouma was to have left them, but he was persuaded to continue. On the voyage down the river another man died of sickness. The natives in canoes and from the banks began to attack them. The little party in the "Joliba" now gave itself over to desperate fighting. The canoe was heavily supplied with muskets and ammunition and these were used all too freely. We cannot be sure that all the charges of recklessness and unnecessary slaughter which the natives brought against Park were true, but it is more than likely that the illnesses he had suffered and the hardships he had borne and the destructive influences of the climate got the better of Park's judgment during the final stages of his trip. It is certain that for 50 years natives of the upper Niger told stories about Park's violent conduct and cited them as excuses for the murder of Laing and other travelers.

Word of the mad white traveler's progress passed ahead of them down the river. At Bussa there was a misunderstanding with the local chief about a present of a rifle which the voyagers had hoped would win them a safe conduct. Here, where the stream narrows and runs between difficult rocks, natives lined the banks. The current was swift and the "Joliba" was swept down, the men in it making a desperate effort to protect themselves. Park, in a last effort to escape, grabbed Martyn and the two jumped overboard and were drowned. Isaaco of course had not seen the ending; he had long since turned back from the party. And Fatouma did not see the ending; he also had left. He had been taken prisoner, but when released he sought out one of the slaves in the canoe who had also been made captive. The slave told him how Martyn and Park went overboard. Before him on the rocks were the many Touareg tribesmen. As the canoe swept onward they continued to throw their spears so that the slave stood up and said, "Stop throwing now, you see nothing in the canoe, and nobody but myself, therefore cease."

Fatouma asked the slave what was left in the canoe: were records there or journals or other property of Park? The slave said there was nothing. He was standing alone and there was just a swordbelt in the bottom of the canoe.

What happened to the swordbelt? The king took it and made a girth for his horse with it.

RICHARD LANDER (1804-1834)

PARK'S death left the Niger still a mystery —a river that flowed eastward and ended no one knew where. The mystery was solved by Richard Lander, a simple English country boy who had spent his youth as a personal servant to travelers. Lander was in fact acting as personal servant to Captain Hugh Clapperton when he began his career on the Niger.

In 1823 Captain Hugh Clapperton, Major Denham and Dr. Oudney tried to reach the river from Tripoli. Clapperton succeeded in getting as far as Sokoto, about five days' journey from the river, and Denham reached the Shari River, which runs into Lake Chad.

In 1825 Clapperton made another attempt with a large party. He had received a letter from Lander describing his earlier life as the son of a poor family in Cornwall and telling how at 9 years of age he had left the family and at 11 had begun a career of foreign travel as servant and courier and had now just returned from serving Major Colebrook during an investigation of South Africa. The letter said Lander would be willing to serve in any capacity "however humble." Clapperton had taken the bright, pleasant-looking youth at his own word.

The expedition sailed to Badagry and proceeded to Sokoto, for it was here that Clapperton counted on the friendly assistance of Sultan Bello. But the expedition fell on a series of disasters. Bello proved sulky. Pearce and Morrison died of fever and Dickson was murdered while engaged on a short trip which he undertook alone. Sultan Bello's tactics delayed them further and, exhausted with fevers, Clapperton died in April, 1827.

Lander was left in a sad, dangerous and rather terrifying position. He was the only white survivor in the expedition. He was in fact the only white man in the whole interior of West Africa. A conservative estimate placed him at 115 days' travel from the coast. He was held by the arbitrary native ruler a virtual prisoner and had only one associate, a native guide named Pasko.

Lander finally won their release. He went to Kano and prospected southward, searching for the Niger, and so discovered at least where the river did not run. He returned to Sokoto and at last to Badagry. Even here his adventures were not ended for, while he was waiting in the town, the natives seized him and subjected him to trial by making him drink a bowl of poison that was supposed to cause the death of guilty persons. Though sickened by the draught, Lander was able to walk slowly and with dignity from the fetish-hut to his own quarters. Here he got the poison speedily out of his system. He came out of the affair with great credit and standing.

On his return to England Lander edited Clapperton's papers and told his own story with wit and vividness, signing himself frankly as Clapperton's servant.

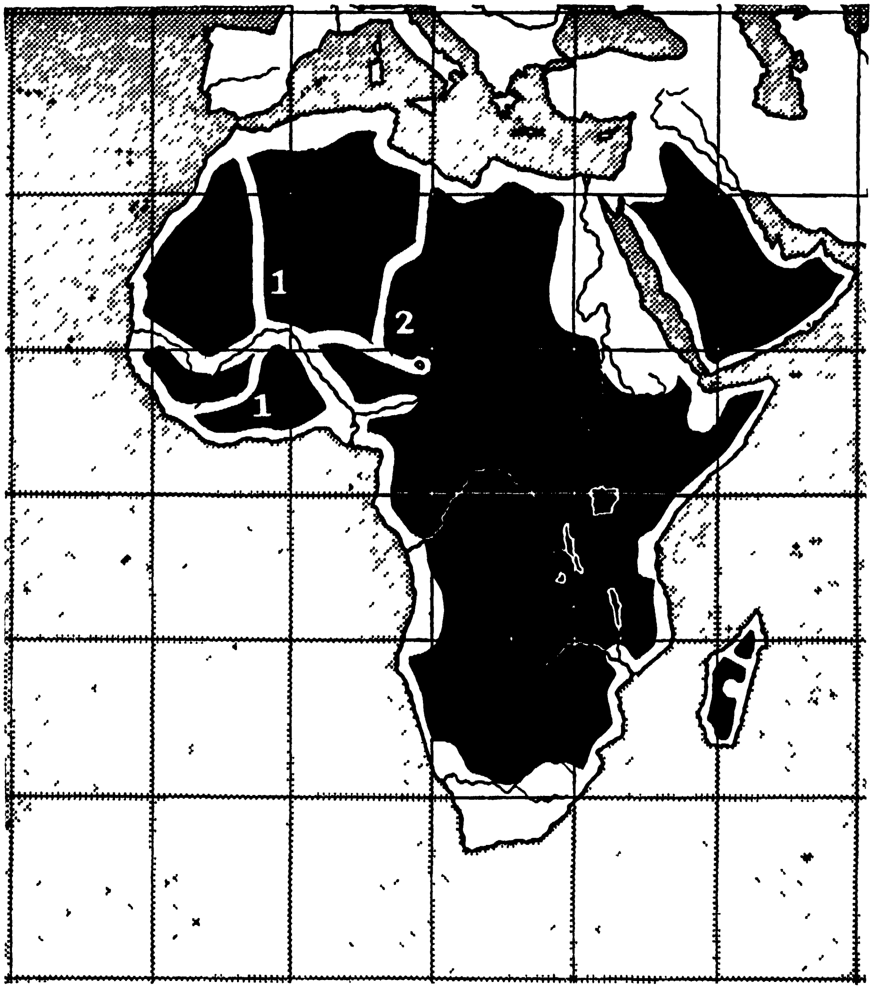
His reports made such a favorable impression that in 1830 he was able to sail on another expedition in which his brother joined him. They reached the Niger at Bussa, where Park had met his death. In fact they recovered a book of logarithms and a *tobe* or robe belonging to Park.

Here the river was narrow and rocky. They embarked from Bussa in canoes and followed the river. Day by day as they proceeded the character of the country changed. They had left behind the mountains, which crowded close to the river's brink along its upper course. The barren and arid patches also grew fewer. The banks of the river diminished in size and flattened out. Presently the banks themselves were replaced by a dense tangle of high-standing vegetation. The trees increased in size until their branches overhung the stream and threw deep shadows across the waters. There were many hippopotami and countless crocodiles and presently they saw occasional Negro villages hidden under the great foliage.

One morning they thought they had reached the end of their journey, for 50 canoes were coming up the river and one of them flew the British Union Jack. Natives in the canoes were dressed in European clothing except for trousers (trousers were reserved for kings). Despite the signs, the natives were hostile to all foreigners. They took Lander and his party prisoner and they were dragged away to King Obie who held them for ransom. They then passed into the hands of King Boy of Brasstown who held them at a still higher figure. Brasstown proved poverty-stricken and filthy, and foreign captives had been known to die there of starvation. But there Lander met the captain of a Spanish schooner who was negotiating for a cargo of slaves. He learned that he was 60 miles from the mouth of the Brass River where an English brig, the "Thomas," was lying. The Brass River was a branch of the Niger. So Lander knew he had virtually accomplished his task and solved the mystery of ages. But he had still to get himself and his party out alive.

Lander promised King Boy that Captain Lake of the "Thomas" would pay their ransom. This Lake refused to do, putting Lander and his party in a desperate situation. The Landers escaped and sailed with the "Thomas," leaving behind an indignant King Boy. They reached the island of Fernando Po on the "Thomas." They had found Lake so disagreeable that they thought themselves fortunate in being able to change ship to the "Caernarvon." They were even more fortunate than they knew, for the "Thomas," sailing directly for England, was lost. The "Caernarvon" made a desperate, long passage to Rio de Janeiro. So many of the officers died that the Landers had to take charge of the vessel themselves. When they finally reached England they were welcomed by the Colonial Office and the government took immediate steps to discharge Lander's indebtedness to King Boy. Richard Lander, the country boy and servant of travelers, was the first man to receive the medal of the Royal Geographical Society.

The Landers attempted to develop the Niger commercially. They went out with two steamers and a large expedition organized by Liverpool merchants. The climate and the tropical diseases began to drop them one by one. Also the natives continued hostile and treacherous. Lander himself was seriously wounded in a native attack but succeeded in sailing with the remnants of his party and in reaching Fernando Po. There were only 8 survivors out of the original party of 48. Lander died on the island.



CAILLIÉ AND BARTH
(1) Caillié, 1824-1828. (2) Barth, 1849-1855.

A Note on Timbuktu

THE origin of Timbuktu is lost in the mists of time before history began. It was the great city of Negro Africa and legends grew up about it that went on for centuries. It was represented as wealthy, magnificent, beautiful—a kind of African "El Dorado." From time to time travelers reached the city and indirect reports were circulated about it. But the legend lived on.

The city was apparently in existence even in classical times and was of purely Negro origin. In the 8th and 9th centuries, the Islamic people reached it and its growth as a trading center was stimulated. Timbuktu is in an advantageous geographical location, being at the very apex of the northern bend of the great Niger River, and it is also on the fringe of the great desert regions. It was thus an important point for trade, for the stream and the banks of the Niger served as highways for the African stocks and the desert trails were roads for the Moors, Berbers and Semitic people of North Africa. There were other African cities at Jenné and Bussa, but they never attained the same romantic reputation with the outside world. This reputation lasted until 1827, when Caillié reached Timbuktu. His return to Europe created a great interest and in 1829 Cambridge University offered a prize for a composition with Timbuktu as its subject. Tennyson won the prize with his first poem.

Caillié gave a realistic description of Timbuktu which should have destroyed the walls and shaken the towers which fancy had built there, but even after Caillié the city continued to have a kind of romantic interest and many explorers and travelers sought to reach it. Here is a partial list of expeditions to Timbuktu:

In classic times: Herodotus reported the story of five young men, the sons of sheiks in the Berber tribe of the Nasamones, who crossed the desert from Libya and saw a great river flowing from west to east. This would be the Niger River and it is likely that they reached it at or near Timbuktu.

1352-1353: Our great Moslem traveler, Ibn Battutá, crossed the Sahara and came to Timbuktu and other "negro lands."

1469: There is some reason to believe that a Florentine, whose name is not preserved, may have crossed the desert in this year and may have seen the city, but of this we cannot be sure.

About 1489: The Portuguese claimed to have seen the city.

16th century: Leo Africanus reached the city and gave us our first description of it.

1630: Paul Imbert, a Frenchman who in 1630 was wrecked on the shore between Morocco and Senegambia and was enslaved by the natives, made a trading journey to Timbuktu with his master. He was one of a number of sailors who suffered a similar fate.

1790: Major Houghton made an attempt from the west coast by going up the Gambia River but was murdered.

1798: Frederick Hornemann in this year started from Egypt, reached Murzuk and had to go north to Tripoli. On a second attempt he started south across the desert and is supposed to have reached the Niger and died there.

1805: Mungo Park passed the city without visiting it.

1825: Major Laing was probably the first European to succeed in the definite intention of reaching Timbuktu. On his return journey he was murdered by Islamic tribesmen.

1827: René Caillié reached the city and gave a true description of its character and succeeded in returning to Europe.

1850: Panet attempted to reach Timbuktu from the French colony of Senegal. He found this impossible and attempted to make his escape across the desert to Morocco but was murdered on the way.

1853: The great German traveler, Heinrich Barth, was successful in reaching Timbuktu in this year.

1860-1862: Mordokhai Abi-Serur lived in Timbuktu during these two years. He had traveled between Timbuktu and Morocco for some years.

1863: Gerhard Rohlfs attempted to cross the desert and reach Timbuktu. Despite the fact that he was an experienced traveler, he failed.

1871: Soleillet, a Frenchman, made the attempt in 1871. He was turned back before he got well beyond Algerian territory.

1874: In this year two of his countrymen, Joubert and Dourneaux-Dupéré, also made the attempt to cross the desert but were murdered at Ghâdames.

1877: E. von Bary made the attempt, starting from Tripoli. He intended to go through Aïr but was murdered on the way.

1880: Timbuktu was again visited, this time by H. O. Lenz, who followed a well-used caravan route.

1889: The siren city claimed another victim in Douls.

In all at least 24 men died or gave their lives in an attempt on the city. These were mostly leaders of expeditions. We do not know how many of less importance suffered a similar fate, and it is likely that our list is not exhaustive.

RENÉ CAILLIÉ (ABOUT 1799-1838)

TWO years after Park came back from his first long trek in Africa, René Caillié was born in the small village of Mauzé, in Deux-Sèvres, France. While Lander, the poor village boy in England, was struggling to make himself a traveler, Caillié, the poor son of a village baker, was going through the same experiences in France. They were traveling at about the same time, and their objective was the same portion of Africa, the mysterious region about the Niger and the city of Timbuktu. Like Lander, Caillié also was excited and interested in reading stories of travel and adventure. *Robinson Crusoe* and later the accounts of Park's travels in Africa stimulated his departure from Europe and his advance into the Sudan. Caillié said that in his day the map of Africa was for the most part marked with great sprawling letters that read "desert" or "unknown country."

When Caillié started out in 1816 he had 60 francs in his pocket. He went to the port of Rochefort and found passage on a little brig called "La Loire" sailing for Senegal. Here he spent a number of years building up an acquaintance with African travel, often making exhausting journeys on foot between St. Louis and Dakar. He had to earn his way and once spent 6 months on a plantation in the West Indies to permit his health and his funds to recuperate. While on a short commercial expedition with Major Gray, thirst and fever wore him out and he returned to France.

Six years later Caillié again grew restless and determined to have another try at African travel. He returned to Senegal and this time was assisted by support from his friends and the encouragement of Baron Roger, governor of the colony. Caillié had been observing the experiences of other African travelers and very wisely had decided that lack of preparation and incomplete knowledge of local ways and customs lay at the back of many of the hardships and persecutions that beset travelers in the interior. He went to live among the Braknas, a tribe of Moors, in order to acquire an acquaintance with the Arabic language and to become familiar with the religious beliefs and ceremonies of the Moors.

When he returned to Senegal and announced his determination to reach Timbuktu, the governor was not as encouraging as he had formerly been. Caillié saw he would have to be more dependent upon his own resources. He went therefore to Sierra Leone and took a position as superintendent of an indigo plantation. Becoming familiar with British authorities, he appealed to them for support in his exploration project. They had supported Major Laing, who had been killed, as well as other expeditions. In polite terms they refused Caillié's request. What they meant was that they were fed up with proposals to reach Timbuktu.

Caillié had saved £80, that is about 2,000 francs, out of his salary. With the greater part of this sum he purchased gunpowder, paper, glassware, tobacco, amber, coral and other trade-goods, not forgetting an umbrella, which every African traveler of the time felt was an essential part of his equipment. He put 300 francs in his girdle, partly in gold and partly in silver coin. Friends presented him with a small store of varied medical supplies, which he also took with him. Then he dressed himself as a Mohammedan traveler, invented a story that he was an Arab from Egypt who had been taken by the French to Senegal. He said he was trying to regain his own country by traveling overland. With this explanation ready to hand he joined a small Mandingo caravan which was heading for the interior. Caillié's plan of action was one of great ingenuity, but if he were once detected in his masquerading he was almost certain to experience death and possibly torture.

His little party consisted of five free Mandingoes, three slaves, a Foulah porter, who took his wife with him, and Caillié himself. All the Mandingoes carried very heavy packs. They traveled eastward from Kakondy (Kakundi) and made their way into the foothills of the Futa-Jallon. This carried them around the upper streams of the Senegal and they crossed into the upper valley of the Niger. Finally, Caillié crossed the Niger at Timé, where he was delayed for four months. During this time he says he suffered seriously from scurvy and that his native host tried to cure him with spells and amulets. During the course of his illness he almost wished that he had died upon the road, but as soon as he began to recover he began to think again of ways of sailing down the Niger and of reaching Timbuktu. He found the country had a strange beauty but that life with his native companions was often extremely irksome.

In January of 1828, with his original guide, he started down the river. He observed that as he progressed the stream grew larger, the land better cultivated and more thickly settled. But he also observed that the character of life was changing. There was less natural gaiety, less amusement and dancing in the villages, no making and drinking of palm-oil wine. In March they came to Jenné. In those days this was one of the large trading towns, serving as a commercial center for a great region in Africa. Caillié was the first European actually to enter the town. Park had only seen it from the river and passed it without stopping. Caillié was amazed both at the number and at the size of the canoes that served as cargo carriers on the river. Many of them were lying along the banks, awaiting cargoes, and others were drawn out of water, undergoing repairs. These vessels were as much as 90 or 100 feet long, 12 to 14 feet in breadth amidships and drawing 6 or 7 feet of water. Caillié reports them as being of 60- or 80-ton burden. He remarks particularly on the fragility of their construction. They were built of planks, the largest of which was 5 feet long and 8 inches broad and about one inch in thickness. These planks were carefully worked and fitted and held together by ingenious lacing with ropes of native manufacture. No metal was employed in the construction of these vessels.

In the town itself he found large bazaars filled with all kinds of native merchandise, which reached this point not only by being brought in from the West African coast but also were carried by the Moorish traders across the desert from Marrakesh and Tunisia. English gunpowder and other trade-goods were particularly in evidence. Native slaves were everywhere herded about the town. They were being bartered and auctioned off at prices ranging from 25,000 to 45,000 cowries. The city was about 2½ miles in circumference and surrounded by an earthen wall. The houses were built of sun-dried brick, one story high, with terraced roofs. In the city Caillié was well received and courteously treated. Some of his hosts even made up a purse of money to help defray his expenses to Timbuktu.

He made the trip down the river in one of the great canoes. It was covered with mats, laden with rice, millet, honey, vegetable butter and other products. During a good part of the trip Caillié remained hidden to avoid the imposition and plunder which all travelers are apt to undergo at the hands of the Touaregs, the savage Berber tribe that gave Park such trouble farther down the river. Still, he had opportunity to observe flotillas of 60 or 80 boats passing up and down the stream, heavily laden with many kinds of cloths, with grains, honey, onions, pistachios, cola-nuts and other local produce.

It took him almost a month to reach Kabra, the port of Timbuktu. Caillié was the first European with ample opportunity for observing this famous city. He found it located in the midst of an immense plain of sand, of a yellowish-white color. It showed no vegetation of any kind. "Nature," he said, "wore a dreary aspect." There were no birds, and a profound silence reigned over the plain. The city itself he found not very different in character from Jenné. From the legends that had been told about it for over 2,000 years, Caillié expected greater wealth and magnificence. In this he was disappointed, but he greatly admired the energy and perseverance that had established the great trading center in this forbidding and desolate spot.

He stayed in Timbuktu from April 20th to May 4th. He joined a caravan and made the crossing of the Sahara in safety but with the usual hardships that such travel involved. He passed through Morocco and reached Fez in August and then sailed from Tangier to France. Caillié was received in Paris with ample recognition for his accomplishments: he was awarded with a prize of 10,000 francs by the Geographical Society of Paris and received the order of the Legion of Honour and a government pension. He had made a journey of 4,500 miles, about 3,000 miles of which had never been traversed before or were almost unknown.

Heinrich Barth (1821-1865)

PATIENT, methodical Heinrich Barth was the next great traveler in Central Africa and the Sudan. He was interested in careful and exact study, but he walked in danger of his life and hardship and adventure were his lot. His methods and his character form a marked contrast to the more impetuous and romantic men who had preceded him in these regions. He was already an experienced traveler and well trained in geographical sciences before he undertook his expedition. He was, in fact, the first scientific explorer of Africa.

Born in Hamburg, Barth studied philology at the University of Berlin and traveled extensively through Mediterranean countries. In 1849, after lecturing at the University on the topography and the commercial history of antiquity, Barth found an opportunity of joining a British expedition to Africa. As originally planned, it was the intent of this expedition, which was headed by James Richardson, to open up the Niger for trade purposes. Barth volunteered to go under condition that scientific exploration in Central Africa should become a primary rather than a secondary interest of the expedition.

They started on the last day of 1849 from Tunis, passing through Tripoli and heading across the desert. Their route was through Murzuk, Ghat and Agades. The expedition had been prepared with German thoroughness and the equipment included a small boat for the navigation of lakes and rivers. This the party lugged with them through the desert, to the great astonishment of the interior tribes.

After they had crossed the desert, they separated, as they felt that more ground could be covered in this way. Barth then proceeded to Kano and then to Kuka, where it had been arranged that they would all meet. Richardson, however, died on the journey, and Barth became the commander of the expedition.

On April 24, 1851, Barth visited Lake Chad and was much impressed with it but realized the difficulties of surveying its shores thoroughly at that time. Further explorations included a visit to the Benué River. In 1852 Overweg, another German in the party, died and was buried along the shores of Lake Chad, which he was the first to navigate. The sailor who had started out with them had been sent back to England at Murzuk, and the servant, whom they had picked up at Tunis, had also returned, so that Barth now found himself the only European survivor of the expedition.

Barth had planned originally to go to Kanem and explore the shores of Lake Chad, but after the death of Overweg he thought this a hazardous undertaking. Instead, he resolved to visit Timbuktu and this he carried out in the fall of the year 1853. Sheik El Bakáy, on whose protection Barth counted, was unfortunately away from the city, and Barth was forced to keep himself in hiding for three weeks until his return. The Sheik's continued kindness made it possible for Barth to remain in Timbuktu for 9 months, though the hostility of the natives frequently endangered his life. Hardly a day, he says, passed without some attempt being made either to seize him or to kill him. At last the Sheik, in order to protect him, took him into his camp. It was finally in May of 1854 that Barth said farewell to his protector and started on the long journey home, reaching London in September, 1855.

Coming as he had through great stretches of desert, Barth had been much impressed with the fertility of the lands along the great navigable rivers. The whole of Central Africa from Bagirmi in the east as far as Timbuktu in the west he had found a rich and prosperous region with a thriving trade passing up and down the Niger and its branch, the Benué. The Benué he figured as extending 600 miles to the eastward, while the Niger could be navigated by small transport ships for over 1,000 miles along its upper course. He had traveled to Kano and found it a great trade center and emporium for all Central Africa. He had also observed caravan trains of 2,000 camels and spoke of such a caravan as though it were a relatively small one.

Barth now settled down as a professor of geography at the University of Berlin. He brought back much detailed information of a section of Africa that extended over 24° from north to south and 20° from east to west. He died in 1865, when he was only 44 years of age. It is probable that illnesses and hardships of his African travel greatly shortened the period of his natural life.

THE NILE

The Nile was the father and mother of one of the greatest and most ancient of civilizations. For centuries the Nile was longer than man's longest possible journey. It reached far into the south, into a region which not even the Egyptians penetrated. It began in mystery that was almost beyond the range of thought. It had a life of its own, it grew, it diminished. It made the land rich, even the desert rich. It was more than a river; it was a giver of life, it had the personality of a god.

There is little wonder that for several millennia the question of where the Nile rose was a matter of fascinated speculation and vague search. Herodotus, who reached the First Cataract in the 5th century B.C., set it down as his opinion that the Nile rose a very long way off to the west, perhaps in the region of Lake Chad. Eratosthenes spoke of two lakes, far to the south near the equator. Ptolemy, in the 1st century, A.D., said that Juba (the same Juba who knew about the Canaries) believed that the Nile rose in a western lake and that it flowed underground for 25 days before it emerged again to become the Nile that was known in Egypt. Strabo introduced a sensible idea when he said that even early investigators knew that the floods of the Nile were due to summer rains falling far away on southern mountains.

We remember Diogenes, the Greek merchant, who said that he marched in from the east coast of Africa and found two lakes and a range of snowy mountains which were the source of the Nile. His was the information that Ptolemy used, adding the notion of the River Astapus, flowing from a lake named Coloe. He also named the great range of hills which extended over 500 miles, the "Mountains of the Moon."

Now, if we assume, as is not unreasonable, that the first two lakes referred to Victoria

Nyanza and Albert Nyanza and that the Lake Coloe stood for the lake called Tsana and that the "Mountains of the Moon" represented the Ruwenzori Mountains, then it is clear that European man was not so ignorant of the origin of the Nile as many have pretended. But men continued to make a mystery of the Nile, for they have a strong tendency to disbelieve anything that they have not seen with their own eyes. Often they will reject a simple matter, plainly stated, and welcome instead tales strange and fascinating to the imagination. Nobody, with the possible exception of Diogenes, had seen these lakes or mountains. So, after Ptolemy, for many centuries stories and fables grew up about the sources of the Nile. These involved the figure of Prester John and a branch of the Nile (possibly the Niger) which flowed to the west and fell into the Atlantic.

Realities were reintroduced when Father Lobo, the Portuguese traveler in Abyssinia, in 1625 described the rise of that branch of the river which flowed through Lake Tsana. James Bruce in 1771 traced the region of the Blue Nile and its connection with the White Nile. But an attack on the general problem had to wait for the English travelers, Burton and Speke, in 1856.

RICHARD BURTON (1821-1890) AND JOHN HANNING SPEKE (1827-1864)

SPEKE, Burton, Baker and Grant, who made great contributions to African exploration, all served their apprenticeship by travel and exploration in India. Speke, for example, held a commission in the Indian army and fought in some of the Punjab campaigns. This would have been a strenuous enough life for most men, but in addition Speke spent his furlough exploring in the Himalayas. He crossed the frontier into Tibet and returned with maps of some of the hitherto unsurveyed southwestern areas.

One would suppose that India and Tibet of those days held out sufficient opportunities and attractions to occupy the most ambitious. But this was not the case with Speke. He turned his attention, instead, to Africa and never resumed an interest in Asian exploration. This was in the 1840's and the early part of the 1850's.

At that time an eccentric Englishman was the object of fame, or at least of rumor, in the districts of Sind. This was a young man named Richard Burton. His methods of travel were not orthodox: he frequently went about in native costume. He lived among the people and came to know them intimately. Tall, lean, dark in appearance, he had a dramatic gift of involving himself in the life and customs of a foreign people. This was one aspect of his lack of conventionality and complete individualism. He was a difficult man to deal with but in collecting information he was an extraordinary asset to a survey. He spoke Hindustani, Persian, Arabic, Gujarati and Marathi languages and knew them not as languages learned out of a book but as parts of a living experience. In 1853, with this training and experience at his back, he went off to Arabia, intending to make an extended trip into the interior. He succeeded only in completing a pilgrimage to Medina and Mecca but this was startling enough to the European world, particularly when his experiences were set forth in a report that had great vividness and considerable literary distinction. It was rumored that Burton had killed a man in self-defense and this rumor was of some embarrassment to him. The embarrassment arose because he had to admit that it was not so.

Clearly, this Burton had a passion and a genius for travel. Clearly also, his impulsiveness and his hatred of restraint might make him a perplexing and thorny traveling companion. He was not the man to associate himself easily with any partner, least of all with one who had grown up under the conventions and disciplines of an English regiment. Yet, Burton and Captain Speke joined forces in 1854. What brought them together was a common interest in Africa and in exploration. In that year they undertook an exploration in Somaliland. Burton and Speke and some other officers who formed this expedition for the Indian government made some advance into the interior. The most difficult part of the trip Burton carried out by himself in his usual impetuous and reckless fashion. He plunged into the desert alone and was not reported for four months. In this time he made his way to Harrar, stayed there ten days, saw the king and returned across the desert. This desert crossing was made with very small provisions, either of food or of water, and involved constant flight from hostile tribesmen. The whole party then tried to advance into the country again. They met with resistance from the natives and in a skirmish both Burton and Speke were wounded.

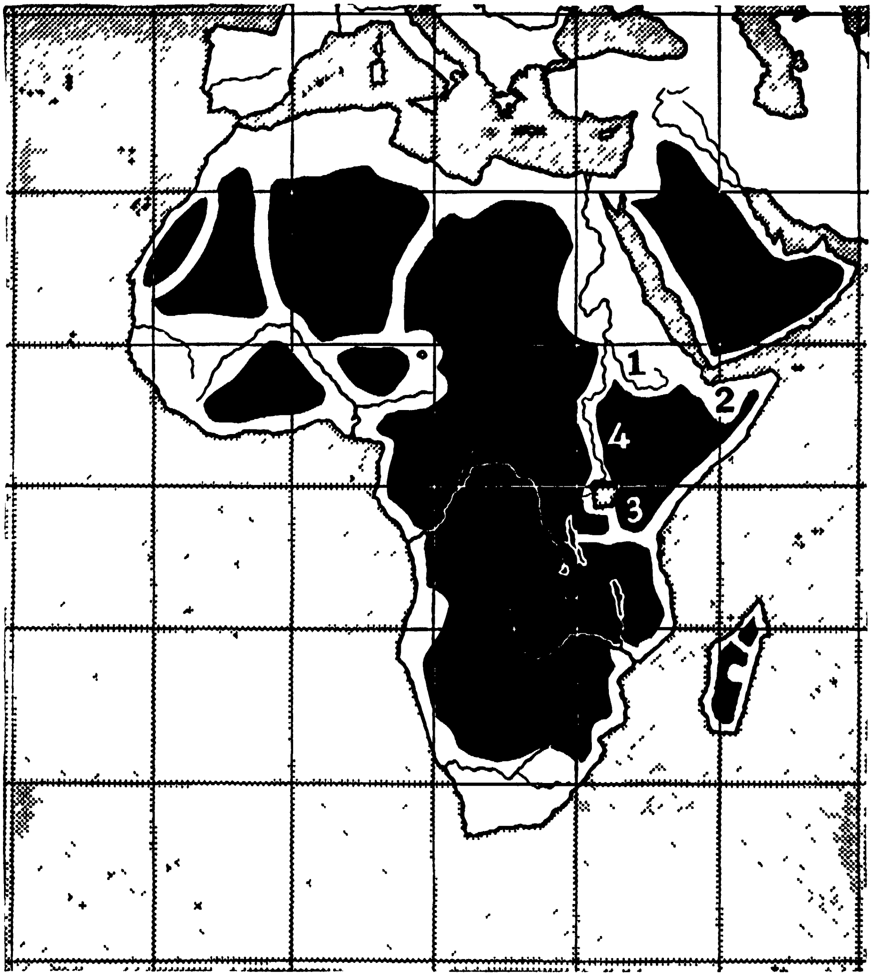
Two years later Burton and Speke, under the auspices of the Royal Geographical Society, started out to search for the lakes in the interior of Africa. Rumors of these lakes and partial descriptions of them reached the coast when tribesmen and traders came down from the interior but this was the first organized party to set out with the definite purpose in mind of reaching and surveying them.

The start of the expedition was not auspicious. In 1857 the two explorers made a preliminary trip in the region about Mombasa. Burton, to say the least, was not tactful in dealing with local officials and this created some difficulty for them. In addition to this, the party suffered from fever and had to fall back upon Zanzibar for a rest. They started again in June and by November had advanced as far as Kazé in the country of the Unyamwezi. Their march of about 500 miles was slow and punctuated with many interruptions, for they had to make their way cautiously from the territory of one local king or chief to that of another, and they had to make many gifts and pay bribes to secure protection and the services of guides. Fever also beset them again. With Speke the fever was intermittent, but Burton suffered continuously. At one time he seemed to be both paralyzed and blinded and was unable to take a very active part in the expedition.

At Kazé they heard from the natives of the three distinct lakes: Nyassa, Ujiji (Tanganyika) and Ukerewe (Victoria). It is interesting to note that at this time, after considering the problem, both men agreed that Ukerewe was probably the source of the Nile.

Speke resolved on his part to visit this lake, Ukerewe. Burton, with plenty of reason for his opinion, thought that this route would involve risk of robbery and other dangers; he meant to head west for Ujiji, but his illness increased rather than diminished and they had to advance again together, Speke assuming most of the duties and responsibilities. They advanced into a more fertile land and into a region of richer vegetation. At the end of 150 miles they were working their way up the slopes of the mountains that bordered on the northern half of Lake Ujiji (Tanganyika). It was now Speke's turn to suffer most acutely from ill health, for a combination of fever and of tropical sun had rendered him almost totally blind, and he was some months in recovering.

Fortunately, they were well received at the Arabian settlement at Ujiji, despite the fact that they had now little to offer in the way of payments and gifts. They had been pretty thoroughly and systematically plucked on the way up country. With Sidi Bombay, who accompanied the expedition as interpreter, and several of their men, Speke made a trip across the lake. His vessel on this voyage was a dugout made



THE NILE, 1771 1864

(1) Bruce traced the Blue Nile, 1771 (2) Burton in Somaliland, 1854 (3) Burton and Speke to Tanganyika, 1856-1858 Speke alone to Victoria Nyanza, 1856 1858 (4) Speke and Grant around the west side of Victoria Nyanza and to Gondokoro on the Nile, 1860 1863

Baker's route to Albert Nyanza, 1863-1865, which lies a little northwest of Victoria Nyanza, is similar to the Speke and Grant route

from a single tree and was driven by a crew of 20 natives. During the trip two things made a great impression upon Speke: the appalling absence of human life and the great richness of animal life. There were plenty of signs that the shores of the lake had once supported a large native population, but at the time of his visit the whole region had been depopulated by the slave-raiders. As for the animals, the problem was not where to look for them but how to avoid getting entangled with them. Crocodiles, of course, swarmed everywhere, but in addition they were continually running into herds of antelope and many long-horned buffaloes. Elephants were there in great numbers, for they had not then been so severely harried by the ivory hunters.

Speke had crossed the lake in the hope of securing a larger boat from an Arab trader and of surveying the body of water more thoroughly to see whether or not it was a source of the Nile, but he had no success in obtaining the vessel and more than 20 years went by before anyone answered this question. Speke returned to Ujiji and picked up Burton and, because their supplies and strength and health were all exhausted, they returned to Kazé, reaching there just a year after they had left Zanzibar.

At Kazé they rested and while they rested the natives kept tantalizing them with further stories about Lake Ukerewe and about the empire of Uganda which stretched along its shores. Burton was too ill to care, or at least too ill to do anything about the matter, but Speke was stirred to renewed activity. He collected a company of about 30 men and with provisions for about six weeks started off. He passed through picturesque and populous country. By July 30, 1858, he had obtained his first glimpse of the lake, but then he got into difficult country and it was not until August 3rd that the full sweep of the lake was exposed to him with its irregular shoreline and its islands.

Speke's resources were exhausted and it was clear that a survey of the lake involved considerable difficulty, so he turned back; but in the few days he was at the lake he was able to make a rough map which he took with him. He named the lake Victoria, in honor of Queen Victoria.

Back at Kazé he was joyfully welcomed by the settlement, but the welcome that he received from his sick comrade, Burton, was not quite as enthusiastic. Speke laid his discovery and his impressions before Burton, only to meet with complete disagreement. The discussion grew into argument and as time went on the argument ripened into debate and the debate into hostility. Given the circumstances—the sickness of one man, the fatigue of the other and the divergence of temperament of both—it is not hard to see how the quarrel arose.

But they went down to the coast together, and Speke secured a passage home on a warship. Burton was too ill for immediate travel and preferred to remain in the warm climate. Before Speke sailed, he and Burton are supposed to have reached an agreement that nothing was to be published regarding the expedition until both men were in England and had an equal opportunity of stating their views and of receiving due credit for their discoveries. Speke may have made such an agreement in good faith, yet when he reached England he at once placed his maps before the Royal Geographical Society. In view of the fact that the expedition was sponsored by the Society, it is a little difficult to see how he could have avoided doing this. Of course this action was regarded by Burton as an unpardonable breach of faith, and it is certain that as a result of it Speke received the major credit for the enterprise. So, when Burton returned, there were some very lively recriminations.

Of course Burton was angry and disturbed; this was in keeping with his character. But he had no need to be concerned about his claim to distinction or even to fame. It did not hinge on the question of whether a stream arose in one lake or another. He had already a notable reputation as a traveler, and he went on to Colonial service and exploration in West Africa and travel in South America and other parts of the world. He had knowledge and talents beyond those of most explorers and is remembered today, not for his travels but for the translation of the *Arabian Nights,* which he completed in his later years.

SPEKE AND GRANT

SPEKE returned for a new attack on the problem of the lakes. This was in 1860, when he set off with James Augustus Grant. They had been serving at the same time in India and had hunted together in the Himalayas. They started in April and arrived in Zanzibar in August, having traveled by way of Madeira, Rio de Janeiro and the Cape of Good Hope. They made elaborate preparations and assembled a retinue of native assistants that ran to 200 men. Speke and Grant were the only Europeans in the party.

It was October before they left Zanzibar. Then, on the first day of the march, a curious incident occurred. Usually it is the explorer who fears the savagery and cannibalism of the natives; this time the misunderstanding was neatly reversed. Ten natives ran away, fearing that the white men were cannibals and that they were being led into the interior to be eaten.

They reached Kazé in January of 1861. Their whole march was attended with all the characteristic difficulties of African travel in those days. There were quarrels, desertions, and drunkenness among the men. An Arab party attempted a raid upon them but was defeated. First Speke was ill and later Grant. Beyond Kazé they separated for a time to cover a greater territory but found that this involved the expense in bribery of conducting two expeditions. Rumanika's territory they found pleasant and interesting, and Grant, who was ill of fever, remained here while Speke pushed on into Uganda.

It was fully a year after leaving Kazé that the two met again in Uganda. They advanced to the Victoria Nyanza. In Uganda the king, Mtesa, tried various expedients for delaying them. It was July before they were finally able to assemble the remnants of their men and resume the march. Grant was ill again and unable to keep up with a rapid advance. He therefore turned westward while Speke pushed on for the spot where he was informed a river left the lake. Finally, Speke reached the banks of the Nile amid a scene of great beauty. A week later, that is on July 28th, he arrived at the rapids where the river emerges from Victoria Nyanza. Speke had now seen about half the lake and had received reports as to the important features in the other half. He regretted that he was not able to carry on some further investigation but was satisfied that he had solved the problem of the Nile's origin. From a point below Ripon Falls, which he named in honor of the president of the Royal Geographical Society, he proceeded in canoes down the river to Kamrasi, where, as he had hoped, he was able to rejoin Grant. They made their way down the river, and it was in February of 1863 that they reached Gondokoro. Here they had hoped to receive assistance from John Petherick, an ivory merchant, but Petherick had been detained by trouble with one of his ships. He had not really expected the Englishmen to get through the country alive.

Though they missed Petherick, they found unexpected assistance from another quarter. While following the banks of the river, they were astonished to see the figure of an excited Englishman coming out to welcome them. This was Samuel Baker, another old sportsman and Indian acquaintance. Baker had organized a large expedition and had come up the river intending to look for them.

Speke told then of reports he had received of the lake, Luta N'zige (Albert Nyanza) and Baker started off for this objective. Speke and Grant used some of Baker's boats in descending the river and arrived in England to receive hearty recognition for their work.

But Speke did not long enjoy his success. Having survived countless dangers and attacks in India and in Africa, he was killed by the accidental discharge of his own gun in the hunting field. This happened just the day before he was to meet his old friend and his old enemy, Burton, in a debate regarding the sources of the Nile.

SIR SAMUEL WHITE BAKER (1821-1893)

BAKER, who remained in Gondokoro when Speke and Grant turned back to England, was an almost perfect model for the English sportsman-traveler. He was not actually until later life a military man and yet he seems to have carried into his travels an organizing bent and a military bearing. He lived most of his life in foreign countries among strange people and yet he never forgot his British attitude and manner. Even in the bush of Central Africa, when he had lost his supplies, his equipment, his clothes, he struggled desperately to keep about him as a robe the rags of his dignity. He knew from months of experience that he was among savage and uncontrolled people in the African wilderness and yet he was always discovering and denouncing their conduct with an air of freshly generated perplexity. These were not the trained servants he had come to depend upon in his hunts in Ceylon, not like the European workers he had supervised in railway construction in eastern Europe. Cutthroats and rascals, no sense of discipline, you know!

Brief as it is, there is something very revealing in the passage in which he describes the meeting at Gondokoro: "My men rushed madly to my boat, with the report that two white men were with them who had come from the sea! Could they be Speke and Grant? Off I ran, and soon met them in reality. Hurrah for Old England! They had come from the Victoria N'Yanza, from which the Nile springs . . . The mystery of ages solved. . . ."

When Baker saw his old friend Speke off down the river, he turned his attention undividedly to the exploration of the lake about which Speke had told him, hoping that he might make some modest contribution to further exploration of the Nile basin. In this he was laboring under several handicaps. He already knew that his men were unreliable to say the least. He had already lost by death a German assistant. He already knew that he was advancing into a country that was beset by the slave-raiders and yet he did not hesitate to express his disapproval of the slave traffic. He actually carried to Khartoum and to Gondokoro letters from the authorities in lower Egypt, as though he expected these letters to have weight. He even brought his wife with him, as though they were just making a country excursion together. To be sure he thought the country was pretty difficult; but there was always a way of doing these things, wasn't there? For all his air of slightly stiff formality, there was no lack of courage about him or his wife. Their conviction that the world ought to be arranged so that they could travel through Central Africa actually carried them through.

At the start he had a mutiny among his men; then they agreed to follow him only eastward, though they knew his intention was to go south. Nobody wanted a man of Baker's social convictions spying on the slave and ivory trade. The men apparently intended to desert him at a trader's camp. At one point in their crabwise advance only a native and a twelve-year-old black boy really remained faithful to the party. Baker tried without success to attach himself to a trader's party going inland. Still he pushed ahead, following the tracks of the traders. Fortunately, the next day he was able to pick up two members of the Latooka tribe whom he had known and aided in Gondokoro. This little band had to take care of 29 heavily laden camels and asses, and the overweighted beasts were always falling into ravines and having to have their packs taken off and readjusted.

They were seven days to Latooka. At Obbo all of the animals died, and there were months of delay during a heavy rainfall. By this time Baker's clothes and those of his wife had nearly all been traded for provisions and other assistance. They were ill of fever, and the supplies of quinine were running low. Beyond Obbo they acquired some porters but the porters later deserted. Thus the supplies they were able to carry were further reduced. They had expected assistance from the chief, Kamrasi, but they were detained in his country by armed and warlike bands. They were allowed to advance, but their rate was set at about 3½ miles a day so that every move they made might be watched and anticipated. Finally they reached Kamrasi's capital and won some assistance from the chief by presenting him with a Persian carpet. After some delay Kamrasi allowed them to advance toward the lake, with two chiefs and 100 men as escort, but the escort gave Baker more trouble than he had when he was advancing with a small party.

They arrived at the lake in a completely exhausted condition. Baker named the lake Albert Nyanza and navigated it on a 13 days' journey in canoes. He studied the flow of the currents in the lake and determined that it was a source of the Nile. The Bakers succeeded in passing down the Nile as far as Murchison Falls; then they had to leave the river and pass through a desolated country where they were detained by involved native warfare. Baker and his wife finally made their escape by creeping through high grass around a native encampment at night. Two years after they had set out, they succeeded in returning to Gondokoro. On their return to England Baker was awarded the medal of the Royal Geographical Society and also one from the Paris Geographical Society and in the succeeding year was knighted.

Baker did not relax his stubborn resentment of the slave-dealers and their methods. Later, at the request of the khedive of Egypt, he took a large military expedition into the country to suppress this trade and served for four years as governor of the territory through which he had passed. The expedition was only partly successful, but it was a not unworthy forerunner of the efforts of Chinese Gordon.

Later he had an orderly gentleman's estate in England and spent most of his time hunting big game in all the odd corners of the world.

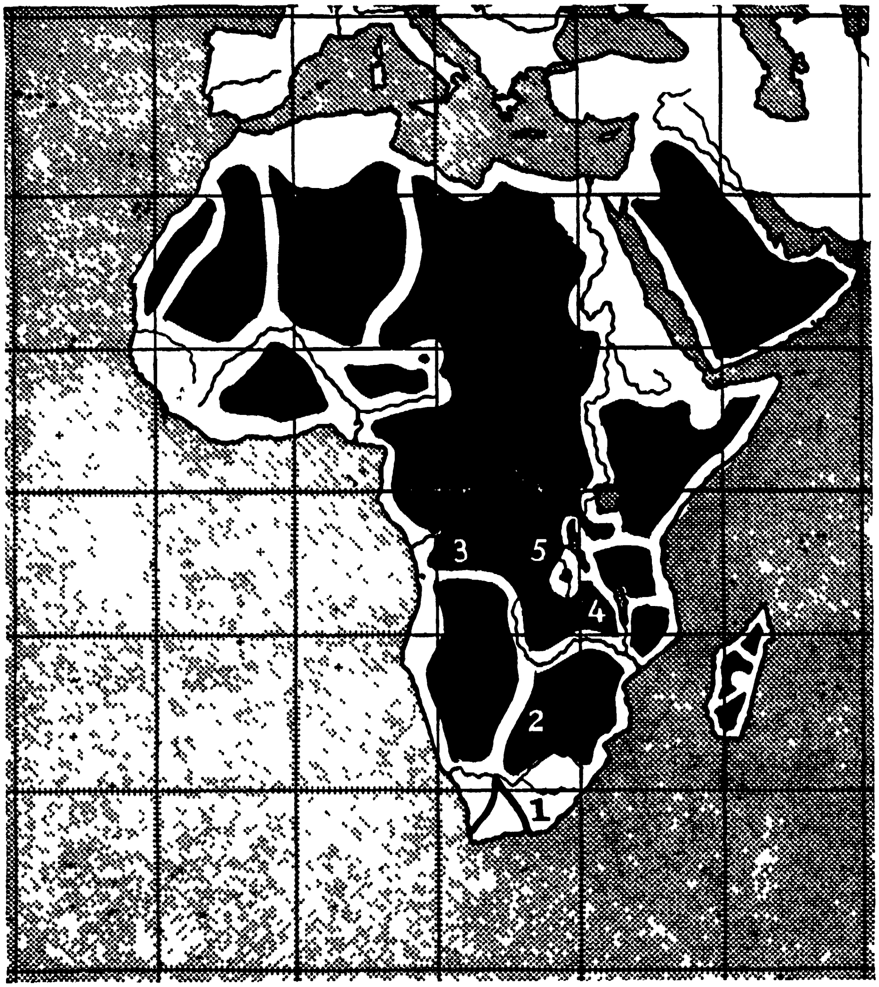
DAVID LIVINGSTONE (1813-1873)

DAVID LIVINGSTONE was a stubborn, serious Scot. He was born in Blantyre, a manufacturing town on the Clyde, and his father, a man of great earnestness, was the deacon of an Independent church and also a traveling dealer in teas. He combined these callings with great skill and simplicity; a tract was delivered by him with each pound of tea.

Livingstone displayed throughout his caree many of his father's characteristics; the same honesty, directness, and great strength of purpose. He showed also the same capacity for combining his interests. When he was a missionary he was not content to remain just that, but mus also make himself an explorer. Later, though exploration became his chief occupation, he neve forgot his missionary interests. Never a very merry man, he still had a kind of grave charm and his fundamental kindliness was relieved by his splendid flashes of real temper.

With these basic characteristics, the stages o his career unroll in an almost natural sequence however extraordinary they sound as isolated events: piecer in a cotton mill at the age of 10 hours of 6 A.M. to 8 P.M. 6 days a week; afte his long day, study at a night school; much scientific reading done at odd moments, even between tasks at the mill; medical classes at Glasgow in the winter; then the determination to become a medical missionary; more serious work i a Glasgow college; then in 1838, at 25 years o age, he is accepted for a missionary post.

It was Livingstone's idea to go to China, bu it was the idea of the London Missionary Societ to send him to Africa, and here he went in 184 His first task, he felt, was to find a spot for a outpost settlement. The idea which he formulated almost at once was that of pioneering i various sections and of training a few nativ workers to carry out the missionary work in d



LIVINGSTONE IN AFRICA, 1841-1856

(1) Routes from Cape Town and Algoa Bay (2) North to the Zambezi (3) Upper Zambezi and across to Loanda on the West Coast (4) To Lake Shirwa, Lake Nyassa and the Rovuma River, 1859-62 (5) Tanganyika, Lake Mweru and Lake Bangweolo, 1867-68.
Died near Lake Bangweolo, 1873

tail. He soon married the daughter of another African missionary, and she came up to live on the Limpopo with him. After two years they moved 40 miles north; another year, and they moved 40 miles west. The tribesmen among whom he had been working had become so fond of him and so dependent upon him that many moved with him.

In 1849, with two English sportsmen, he made a trip to Lake Ngami. This was the first time Europeans had visited this lake and the trip, in which his wife and children accompanied him, involved the crossing of the Kalahari Desert. The trip gave him a real taste of exploration, and after this he lived more as an explorer than as a missionary. The next year, with his wife and three children, he made another trip across the Kalahari northward and succeeded in meeting the chief of the Makololo, who promised him aid but died shortly afterward. The chief's daughter, however, carried on the friendship and Livingstone achieved what he wanted—the privilege of unmolested travel. He also succeeded in discovering the Zambesi River in the interior.

Only the lower river was previously known.

In 1852 Livingstone made the trip to Capetown for the purpose of sending his family back to England. He had concluded that the climate was too severe for them and no doubt also he felt that with them safely returned he would be freer in his movements. This was the first time that he had been in a civilized community in 11 years.

In June he started from Capetown north on a journey that turned out to be a long and extremely important exploration. At first he traveled by ox-cart, accompanied by a number of natives who had been in his employ. He reached the capital of the Makololo and stayed there for a month. During this period he had a bout with the fever. Then he commenced the exploration of the Zambesi River with a fleet of 33 canoes, carrying 160 men. After considerable travel on the river, he returned to the capital Linyanti. With a small company of men and the barest essentials of equipment, he embarked on the River Chobe to work his way westward. In February of 1854 he reached Lake Dilolo but the going was extremely difficult for him. He was frequently ill with fever, had great difficulty in establishing discipline over his men and in keeping them from open mutiny. Also, they suffered from an attack by hostile natives.

Two things kept him to his task; he felt in the first place that the route he had traversed had not proved a good one for the establishment of a mission station; also, he had promised the Makololo people that he would return them to their homes. He collected some provisions, armed his men, and accepted from the local bishop a fresh tent and the services of 20 men as carriers. In September he followed the sea to the mouth of the Bengo River and then ascended this stream. This route made him familiar with a new range of territory and occupied him for a year, so that it was September before he returned again to Linyanti, the Makololo capital. He had brought his men back after this long trip without the loss of a life or any serious casualty.

He now decided to continue his journey to the east coast, in the hope of finding a favorable locality and climate for the mission's work. He was again assisted by the friendly chief, Sekeletu. During a great part of his work and travel he was dependent on friendly natives, not only for encouragement but for supplies and means of transport. Livingstone determined to follow the Zambesi River, and after a trip of two weeks made the discovery of the great Victoria Falls. The natives referred to the falls as "smoke that sounds" and stood at a distance in great awe of the impressive sight. Livingstone says: "I . . . saw a stream of a thousand yards broad leaped down a hundred feet and then became suddenly compressed into a space of fifteen or twenty yards. . . . The entire falls are simply a crack made in a hard basaltic rock from the right to the left bank of the Zambesi, and then prolonged from the left bank away through thirty or forty miles of hills."

He found the country very beautiful and filled with wild animals of many kinds. Elephants, buffaloes and zebras appeared in herds of great numbers. During the winter he continued to follow the Zambesi, passed its junction with the Loangwa and made his way, not without difficulty, through hostile country. It wa January when he succeeded in crossing the rive and reaching the southern bank. By March h had arrived at Tete, a settlement in Portugues territory. Here he was very hospitably receive and given the kindly treatment which he s greatly needed, for fever and scanty diet ha brought him to a condition of great emaciation He reached Quilimane on the coast in May an was prostrated by fever. He had spent four year in almost continuous travel and had covere 11,000 miles through country, most of whic had never been traversed before by a white man. He arrived in London at the close of the year, after an absence of 16 years. During the last three years of this period he had had no word from his family.

Livingstone was hailed as a hero when he returned to London and received many honors, including the medal of the Royal Geographical Society. The recognition was indeed deserved. He had made the first crossings of the southern portion of the continent and had brought back the first reports on great stretches of the interior. His information necessitated the reconstruction of the map of Africa. He had taken a sextant with artificial horizon with him and brought back an accurate set of observations. His biological notes and reports on trade routes were also of service.

He remained in England through the year 1857, dropped his connection with the London Missionary Society and received word from an enthusiastic government that he was to conduct further researches with its assistance. There was to be an expedition on a grand scale, the purpose of which was to open up "highways for commerce and Christianity to pass into the vast interior of Africa." No expense was spared on the expedition and provision was made for a physician, an artist, a geologist and Livingstone's brother, Charles, to go along. Transport was provided in H.M.S. "Pearl." In April, 1858, they reached the mouth of the Zambesi and spent the remainder of the year in examining the river up to rapids which barred further progress. The party arrived finally at Tete, where Livingstone was joyously welcomed by the Makololo natives whom he had left there on his previous trip. Livingstone explored the Shiré as far as a beautiful cataract which he named Murchison Falls. (This is not to be confused with the falls on the Nile to which Baker had already assigned the name Murchison Falls.)

Other explorations were carried out, including the discovery of Lake Shirwa and a preliminary cast in the direction of Lake Nyassa about which they had received information. A final trip carried them over the beautiful Shiré highlands and up the fertile and populous river-valley. By this route they arrived at Lake Nyassa. Livingstone discovered the lake two months before a Dr. Albert Roscher also reached its shores. Roscher was killed before he could complete his trip.

Livingstone's party returned to Tete on the Zambesi in an exhausted condition and far from harmonious state of mind. Their food had been badly prepared and had poisoned some of the party. On the river the wheezy launch on which they depended gave them endless trouble. She was in such a leaky condition that for safety she was grounded on a sandbank every night.

In 1860 Livingstone returned to the Makololo country, largely because he had promised to return the natives to their home and because he was awaiting the arrival of a new ship. This vessel, the "Pioneer," arrived during the next year and Livingstone explored the River Rovuma in her, and he also revisited the valley of the Shiré, which he found this time devastated by the slave-raiders. The new ship, however, drew too much water and grounded frequently. None the less, the fall of the year was spent in exploring Lake Nyassa.

This was not a happy year, despite the encouragement that the new steamer seemed to provide. Travel went forward very slowly; the old engine of the "Pioneer" gave great trouble and held the party up almost six months; the new steamer had to be assembled and this was a slow task. Also, fever of unusual severity swept the east coast. Mrs. Livingstone was taken ill and died and this threw Livingstone into extreme depression. Finally, the new "Lady Nyassa" was launched but by this time Livingstone seems to have been filled with disgust and dread of the Zambesi drainage basin. It had cost them all too much!

Livingstone therefore changed his line of operation. He traveled in the new steamer up the coast to the mouth of the River Rovuma, which was explored for 160 miles. The next year, 1863, was devoted to an attempt to reach the lake by way of the River Shiré. Again raiding and drought had spread over the valley. Corpses floated down the river and in his journal Livingstone wrote: "Wherever we took a walk, human skeletons were seen in every direction." By the close of the year, all of the party were seriously ill. The expedition was recalled to England.

Livingstone was, of course, welcomed home, but there was not the enthusiasm about his second return that had marked his first arrival. The expedition had consumed a great deal of time and money and, while it had discovered a great fresh-water lake, the results of this larger expedition were not as impressive as those of Livingstone's first solitary travel. In his case, it was clearly true that he traveled fastest when he traveled alone.

Livingstone did not stay long in England. All his attention was now directed to the continent of which he had become so much a part. He went back with the intention of seeing what could be done with the suppression of the slave traffic and also with the idea of following the watershed between the lakes Nyassa and Tanganyika and re-examining the sources of the Nile.

He reached Zanzibar in the early part of the year 1866. He started up country with a considerable expedition but most of the men deserted, leaving him finally with four or five boys whom he was able to handle and with whom he made some progress. He rounded the southern end of Lake Nyassa and crossed the Loangwa. It was then his intention to reach the southern end of Lake Tanganyika.

Livingstone's health was now failing him and he suffered not only from fever but from an accumulating series of other ailments. Yet, he kept on with a kind of dogged determination that was more a mark of courage than of good judgment. From Tanganyika, having traveled through hitherto unexplored territory, he passed to Lake Mweru. The next year he went along the western shore of Tanganyika and at this time was so ill that much of his progress was made in a swinging cot carried on poles by Arab bearers, but he succeeded in reaching Lake Bangweolo and also in arriving at the shore of the Lualaba River. This river he held to be a part of the Nile and its farthest source. But in fact the Lualaba was later demonstrated to be one of the upper arms of the Congo system.

The next year he crossed Lake Tanganyika in canoes and came to the settlement at Ujiji for a rest. This he greatly needed, for he was, as he himself says, "a ruckle of bones." This town was the headquarters for the slave trade and the ivory trade which were in the control of the Arabs. They received Livingstone hospitably enough for they liked him, though they knew he was their enemy on the slavery question.

The problem of the Nile still kept running through his head, and he made a nightmarish kind of journey to the Lualaba and returned without adding greatly to his comprehension of the problem. He was completely worn out and cast down when he returned to Ujiji. Then, on October 24, 1871, he made this entry in his journal:

> "But when my spirits were at their lowest ebb the good Samaritan was close at hand, for one morning Susi came running, at the top of his speed, and gasped out, 'An Englishman! I see him!' and off he darted to meet him. The American flag at the head of a caravan told of the nationality of the stranger. Bales of goods, baths of tin, huge kettles, cooking-pots, tents, etc., made me think, 'This must be a luxurious traveler, and not one at his wits' end like me.'

"It was Henry Moreland Stanley, the traveling correspondent of the *New York Herald,* sent by James Gordon Bennett, junior, at an expense of more than £4,000 to obtain accurate information about Dr. Livingstone if living, and if dead, to bring home my bones."

Livingstone, usually accurate and careful in his observations, gives the date of the meeting in his journal as October 24th, whereas we know from Stanley's account that it was really November 10th. In addition, Stanley's name was Henry *Morton* Stanley rather than Henry Moreland Stanley as Livingstone entered it in his journal. The entry itself is probably a reflection of his excitement, isolation and his increasing weariness.

Stanley's relief expedition heartened him and brought him the material assistance he so badly needed. But it was not his intention to return, as Stanley urged him to do. Together, Stanley and Livingstone explored the north end of Tanganyika and returned to the country of the Unyamwezi. Here Stanley planned for the delivery to Livingstone of further supplies and equipment. Stanley himself returned to the coast, taking Livingstone's journals and papers with him for delivery in England.

After a considerable wait in this territory Livingstone set off again, determined to expend his last resources and strength on the Lualaba-Nile question. He went by the eastern shore of Tanganyika and reached Lake Bangweolo. In the early part of the year 1873, after long and difficult wanderings, he was in the jungle on the eastern side of this lake. His health was failing rapidly, and he had recourse again to the improvised litter carried on the shoulders of his men.

The progress of his decline is reflected in his journal as his entries became briefer and less clear.

In April he is in the district of Ilala. It is Chitambo's village.

There are several days in the journal in which only dates are entered.

On April 27th there are these words: "Knocked up quite, and remain—recover—sent to buy milch-goats. We are on the banks of the Molilamo."

On May 1st, his men enter his shelter and find him kneeling by the bed—dead in the heart of Africa.

HENRY MORTON STANLEY (ABOUT 1840-1904)

IN 1856 a young boy by the name of John Rowlands received a thrashing in a Welsh workhouse. He ran away and thus commenced a lifetime of travel. His mother was poor, and his other relatives were almost equally unfortunate, so that he worked in a haberdasher's shop, in a butcher shop and finally took a job as cabin boy on a ship bound for New Orleans. Here he was adopted and, taking the name of his benefactor, became known as Henry Morton Stanley.

In America in the early sixties he passed rapidly through a succession of adventures that greatly widened his experience. He started to acquire business experience and kept a country store in Arkansas; he joined the Confederate Army and was taken prisoner at the battle of Shiloh; he suffered greatly in a prison camp and then, finding he had misunderstood the issues of the war, was willing to obtain his release from prison by enrolling in a Federal cavalry regiment. He was discharged later as unfit and made his way to Liverpool and to his home. He was not in good health, was poor and shabby, and his mother regarded him, not unjustifiably, as a good deal of a tramp. She turned him away and her attitude saddened him and made a deep impression on him. He thought he carried the marks of this encounter for the rest of his life.

To make a living he went to sea again, was wrecked off Barcelona, and in 1864 joined the United States Navy. From the Navy at the close of the war he passed to journalism, spent a short while with an expedition against the Indians in the West and then went to report the events of a British expedition against the emperor of Abyssinia. This was his first assignment for the New York *Herald*. His success in traveling rapidly, in writing brisk and vivid despatches and in getting them cabled at a time when other messages were blocked won the recognition of James Gordon Bennett, who was then sparing no expense to make the New York *Herald* a lively newspaper.

Stanley had the experience and the character that were likely to make him a good reporter and he had a ready gift for dramatizing himself in relation to the news that he was reporting. Bennett had a quick eye to see all of this. He saw the man and he also saw just the work on which he might be employed.

This was then 1869 and four years previously Dr. Livingstone had commenced his march into the interior of Africa and since that time had been unreported. There had of course been concern over Livingstone's safety. A relief expedition from England was in process of organization, but there was no general excitement. Many people assumed without much further consideration that Livingstone had died. Bennett saw the opportunity for dramatizing the situation and making exclusive news for his paper. He picked Stanley to carry out his plans.

Bennett was in Paris when he developed this idea. He sent an urgent telegram to Stanley, who was in Spain, and Stanley arrived in Paris in great haste. We might suppose from these facts and from what was supposed to be Livingstone's situation that Bennett was in breathless haste to recover the African explorer and that Stanley was to start out on the most direct route to his objective. Bennett, however, had other plans.

Stanley was to proceed to the Suez Canal and then go up the Nile. Here he was supposed to see Baker, who was starting on an expedition. Stanley was to write a guide-book for lower Egypt, was to go to Jerusalem, Constantinople, the battlefields of the Crimea, cross the Caucasus to the Caspian, get through Persia to India, stopping on the way to write a letter about Persepolis, visit Bagdad, report on the state of the Euphrates Valley railway and do a few other odd jobs.

"Then, when you have come to India, you can go after Livingstone. Probably you will hear by that time that Livingstone is on his way to Zanzibar; but if not, go into the interior and find him, if alive. Get what news of his discoveries you can; and, if you find he is dead, bring all possible proofs of his being dead. That is all."

We must remember, of course, that recognized travel routes to Central Africa were not then existent and that all connection, even with the African coasts, was circuitous. Still, the line of travel indicated for Stanley may be referred to as indirect, if not leisurely. Despite what Stanley later wrote and despite the emotion he described (and no doubt felt) the meeting with Livingstone was really conceived as a climax to a set of news stories! It appears from this conversation that Bennett's purpose was not to save Livingstone but to find out whether or not he were dead. Stanley literally carried out his employer's instructions. It was 15 months after the conversation in Paris before he arrived on the African coast and commenced the organization of his trip into the interior.

In the short trip with Livingstone about the northern shores of Tanganyika, Stanley got a taste of exploration that determined the rest of his career. But in a way he paid for his experience. When he returned to England, he was rewarded by the Queen for carrying assistance to Dr. Livingstone, but he had thrust himself into a dramatic situation which he and Bennett had managed to heighten, if not to create. Furthermore, the British relief expedition, of which Livingstone's son was a member, had been late in arriving. The American expedition was charged with intruding and there was a good deal of resentment and criticism, aimed of course at Stanley.

In 1874 the *Daily Telegraph* and the New York *Herald* sent Stanley out on a combined British-American expedition to complete the Central African explorations that had been started by Livingstone, Speke and Baker. Again Stanley went out amply provided with funds. He had with him also a man by the name of Barker and two brothers, Edward and Frank Pocock.

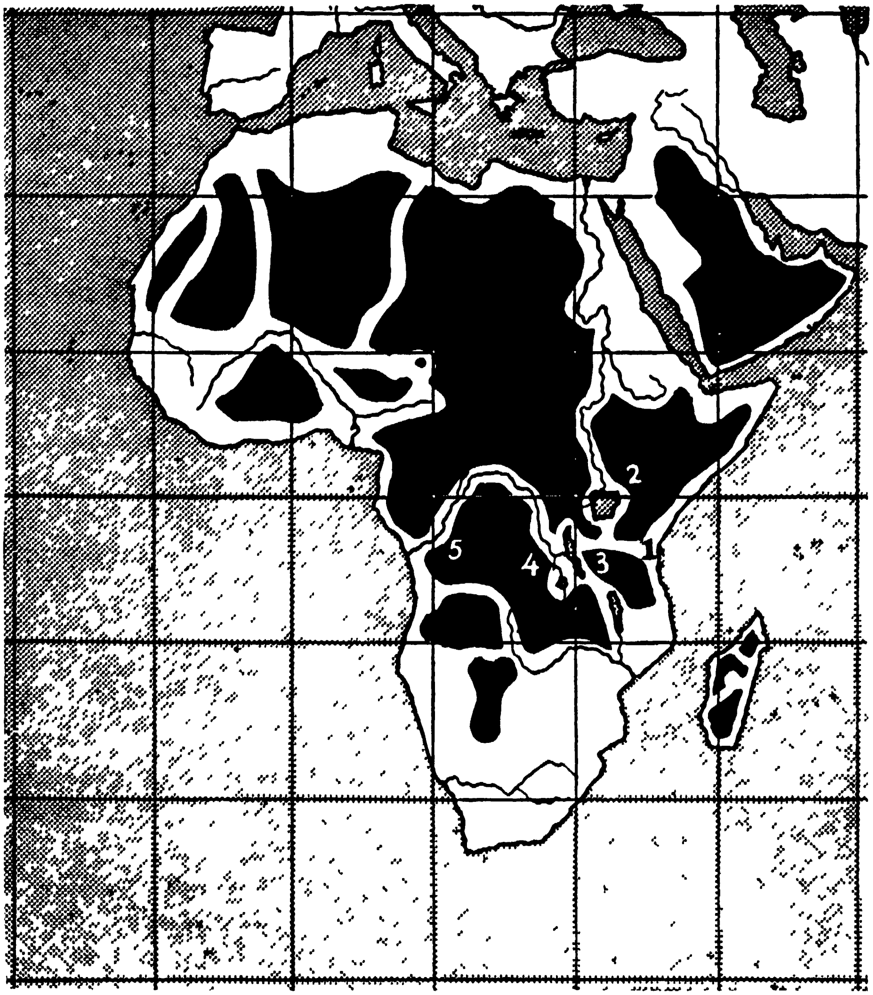
In Zanzibar the 9 tons of equipment which they had taken out was divided into 60-pound packs. They left Bagamoyo on the east coast opposite Zanzibar on November 17th with an enormous retinue that numbered more than 300. They proceeded up country with the usual accompaniment of difficulties but Stanley had a drive and a capacity for leadership and organization. He could travel with a large expedition where other travelers under similar conditions would have failed, so that he arrived at Lake Victoria in February, 1875, without any unusual disasters. Their greatest loss had been the death of Edward Pocock of typhus.

At the lake they had assembled the small steamer, the "Lady Alice," which had been carried in on the backs of the men. Stanley and a small company of natives completely circumnavigated the lake in this vessel. This in itself was no inconsiderable accomplishment, for the lake is given to sudden and violent storms and in those days was surrounded by most unfriendly tribesmen. He also visited Uganda where Mtesa, the king, who was already acquainted with Europeans in the persons of Baker and Speke, received him in magnificent style. The whole of the years 1875 and 1876 were spent in exploring this lake and a smaller lake which Stanley discovered. The natives were afraid and prevented him from examining this latter lake in detail. Years later he revisited it, named it Albert Edward Nyanza and determined that it was connected by the Semliki River with Lake Albert.

In the spring of 1876 Stanley returned to the Tanganyika problem and examined its outlet through the Lukuga River. Cameron had visited this region previously and had reported this exit of the lake. Stanley said he felt uncertain whether the river contributed to the Nile, the Congo, or the Zambesi. On this trip he found the lake and river to be part of the Congo system. The independent travel of Cameron was also responsible for Stanley's interest in the question of the Lualaba. Cameron had reported that the Lualaba flowed into the great river that had previously been reported by Livingstone. This stream, which he referred to as Dr. Livingstone's River, Stanley determined to investigate.

He arrived at his decision in a curious and characteristic fashion. They had been told by natives repeatedly that the Lualaba ran north. They were on a watershed, and the question was whether it would be more profitable to follow the Lualaba north or go south to the Zambesi. He and Frank Pocock decided to flip a coin, heads or tails, two out of three, to decide their choice; tails for the south and heads for the north. The coin fell tails six times running. To make certain what they should do they then drew lots with long and short straws. The south again won three times straight. So they decided to go north! At least they found out where interest and judgment really led them.

They left in October of 1876 with the definite intention of investigating the western half of the continent. The party this time included 400 men of the chieftain, Tippu-Tib. They were leaving now the country that was within the farthest reach of the Arab traders from Zanzibar on the east coast. For a time they had to cut their way



STANLEY ACROSS AFRICA, 1874

(1) Landed from Zanzibar. (2) Sailed about Lake Victoria, 1875 (3) Sailed about Tanganyika, 1876. (4) Started down the Lualaba (the Congo) 1876. (5) Reached Stanley Pool and the Coast, 1877. Stanley developed the Congo route from the Atlantic side, 1879-1884

through primeval forest. In mid-November they reached the Lualaba River. Here they assembled the "Lady Alice" which they had brought with them. They proceeded down the Lualaba, which then developed into Livingstone's River, which in turn proved to be the Congo.

During their progress on the Lualaba they were often out of food, for the natives were afraid of them. They also had continuous brushes with hostile and cannibalistic tribes. In December Tippu-Tib turned back, though many of his men continued with Stanley. By January of 1877 they had passed four cataracts. They had to build a road or trail to circumvent each. The boat was hauled over these roads for considerable distances, and the operations had often to be carried out while they were subjected to attacks by the natives. In March they came to Stanley Falls and to the Dover Cliffs. It took them 22 days to circumvent the falls, and in the operation a canoe manned by Stanley's favorite boy and five other natives was carried over the falls and all were drowned.

They continued down the river and in June, at Zinga Falls, Stanley's last European companion, Frank Pocock, was also drowned. At the end of July Stanley decided to continue by marching on shore. After 7,000 miles of navigation in Africa, the "Lady Alice" was drawn ashore and abandoned. There were 40 on the sick list, when they commenced their march August 1st. After so much travel they felt that they must be near the sea, yet the way seemed interminable and at times they doubted whether they should ever get through. Finally, on August 4th, on the verge of exhaustion and starvation, they received word that there were Europeans not far away at Boma. Stanley sent guides ahead with letters in French, Portuguese, and English. In a few days the men returned with some supplies from the English factory at Boma and on August 9th Stanley's party arrived there, 999 days after leaving Zanzibar.

The trip was really a magnificent accomplishment. Stanley had followed and exposed nearly the complete course of the Congo. He had extended the knowledge of the lake country and thrown light on a number of other geographical problems, but he had also succeeded in the thing that had been so dear to the mind of Livingstone—he had discovered in the river a great and practicable highway into the center of Africa and had made it clear that Africa held out the promise of commercial development.

This, of course, had not been accomplished without the payment of a heavy cost. Only 108 of his party survived the trip; 173 were lost on the road, 58 killed in battle, 14 drowned, and others had succumbed to the climate.

Stanley tried to arouse the interest of England in African exploration and in the development of the Congo system. He failed in England but succeeded in Belgium, so in 1879 he went back to the mouth of the Congo under Belgian auspices. Once he was started, it became clear to the European powers that there was something in his contention after all. International rivalries developed while Stanley carried his work forward. Symmons says: "When Stanley made his great discovery the total area in Africa appropriated by European powers was less than two-and-a-half out of eleven-and-a-half million square miles; within seventeen years hardly a hundred miles remained unclaimed."

Stanley spent five years in the Congo on this trip, a considerable part of his time being devoted to building a highway around the cataracts and in other efforts to open up the region to travel and commerce. His activities had much to do with the establishment of the Congo Free State under the sovereignty of Belgium.

Stanley's last trip in Africa began in 1887 when he was asked by the khedive of Egypt to undertake an expedition for the relief of Emin Pasha.

This Emin Pasha was a curious character. He was not really, as one might suppose from his name, a Turk or a Moslem. He was in reality Dr. Edouard Schnitzer, a German-Jewish physician, scientist and wanderer who had been drifting about the Mediterranean, the Near East and Egypt for a number of years. He had finally worked his way into the Sudan and Gordon had appointed him governor of the district of Equatoria. Then had come the massacre of the garrison at Khartoum and the population had been reduced to slavery. Emin Pasha was cut off and was supposedly left in a position of great danger. This was the man Stanley was supposed to relieve and rescue.

Elaborate plans were made for a large expedition. The trade-goods taken consisted of 30,000 yards of cloth, 3,600 pounds of beads, a ton or so of brass, copper and iron wire, a steel boat and a store of arms and of munitions. There were four other Europeans, all of them with army experience, as well as other African travelers and fighters. Stanley decided to advance through the Congo because he was familiar with this territory. But first he proceeded to Zanzibar where he met Tippu-Tib and collected a force of his men. Stanley with this large expedition then sailed around to the mouth of the Congo and advanced up the river. In the heart of the continent he divided his forces and he, himself, with a picked group of less than 400 men, advanced to Albert Nyanza. He arrived there, however, after great difficulties, with a force only half this number. He was unable to do very much on the lake because the boat had not been brought forward with him. The rear guard, under Major Barttelot, was delayed in coming up. Stanley returned to collect some of his straggling forces and to bring forward the boat.

Stanley finally effected a meeting at Lake Albert with Emin Pasha who had come by boat up the Nile and down the lake. The object of this great search was not as overjoyed at his rescue as might have been anticipated. He had managed to struggle through the period of his isolation and at least in his own opinion had maintained his position as the head of a large and important district. He stood in a curious relationship to the natives, being partly their leader and partly their prisoner. He had hopes of continuing under the Khedive, holding a position of authority. On the whole, he was a curious and indecisive character; he vacillated in his determination to stay in Africa, where he had a peculiar position which he could not hope to duplicate elsewhere. He was also more of a scholar than a man of action, and he took a great delight in the rich field of investigation that lay about him in Africa. Though relations between the men were supposedly friendly, on the whole it is not to be wondered at that he and Stanley did not have a very deep understanding of each other.

Most of the year 1888 was spent by Stanley in returning to straighten out the sad tangle of the rear guard which had never come up to join him. He found that Barttelot had been shot by one of Tippu-Tib's men and that the affairs of this section of his forces were in a generally sorry condition.

In 1889 Stanley brought up the stragglers to Albert Nyanza and again joined Emin Pasha and his forces. They then decided to work their way out by way of Zanzibar. The combined caravan numbered over 1,500. Despite this large number, the line of march which they chose gave the trip the character of an exploration. They crossed the Semliki River, which connects Lake Albert with Lake Albert Edward, and were then advancing into new territory. They sighted the peaks of the Ruwenzori, otherwise known as the "Mountains of the Moon," and Lieutenant Stairs led a small expedition to a level of over 10,000 feet in these mountains. Also, in this district Stanley discovered a salt lake which was the source of an extensive native trade in salt.

They proceeded in a long march that took them finally to a main station at the south end of Victoria Nyanza. From here on his march to the coast Stanley added to his party missionaries of various nationalities and other travelers who were glad of the protection of so large an army on the march. He reached Zanzibar at the end of 1889.

This concluded Stanley's African travels, save for a brief visit as the guest of the British South African Company some years later. In England Stanley married and settled down, became a British subject and was elected to Parliament.

So rapid and so extensive has been the development of Africa that the life of the continent has been greatly altered since Stanley's day. Many features of the life, which he was the first white man to see, have already disappeared, and his activities and those of Livingstone have taken on a historic, not to say a legendary, character. Yet Stanley lived until 1904, and he was then only 64 years of age.

OTHERS IN AFRICA

THE 10 men whose stories we have told were the giants of African travel. Their combined journeys, carried out in a period of less than a century, sectioned the continent and gave us a general knowledge of its interior. But there were others who helped in the development of the African map. In a less busy time they would have attracted greater interest and won more enduring reputations.

VERNEY LOVETT CAMERON traveled in Livingstone's period and preceded Stanley in the region to the east of Lake Tanganyika and there discovered the Lukuga River. Had he followed up his observations on the Lualaba River, as Stanley did, he would have become the discoverer of the Congo basin. He did not do this, for he would not treat the natives as slaves and there was no other way to induce men to go down the river. He did succeed, however, in carrying out an arduous crossing of equatorial Africa, arriving at the Atlantic coast in the Portuguese territory which is now Angola.

FRIEDRICH GERHARD ROHLFS went to Africa first in 1855 in service in the French Foreign Legion. He spent 16 years in intensive exploration and was occupied in Africa for a period of over 30 years. Like Caillié, who preceded him in northwestern Africa, he adopted a disguise and traveled more or less in the local fashion. In 1862 he traveled from Tangier through Fez and Morocco and made his way through the county of the Sus to Tafilelt. Caillié was the only European to reach this spot before him. Then Rohlfs attempted to cross the desert to Timbuktu but was unsuccessful. In 1865, however, he made the crossing from Tripoli to Murzuk and from Murzuk to Bornu. He made his way down the Benué River and then down the Niger. Later he skirted the northern coast of Africa from Tripoli to Alexandria and also carried out explorations in Abyssinia. He ended his career as German consul at Zanzibar.

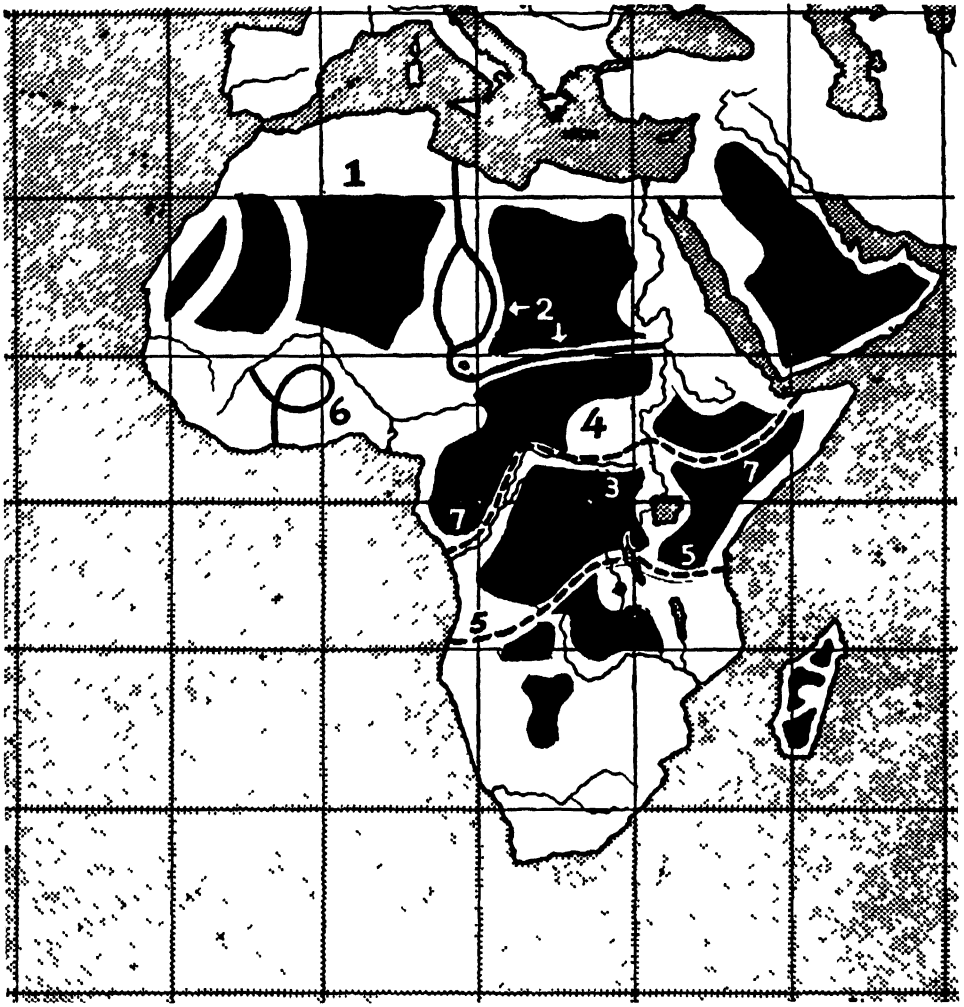
GEORG SCHWEINFURTH was a botanist as well as an explorer. He began his explorations on the African coasts of the Red Sea and went through Abyssinia to Khartoum. Later he traveled extensively in the western part of the Nile basin and also discovered the Welle River.

GUSTAV NACHTIGAL, commencing his journeys about 1870, traveled extensively in the eastern Sahara district. He was the first European to reach the Tibesti country and to make a transverse from the region south of this to the Nile.

WILHELM JOHANN JUNKER a decade later was the successor of Schweinfurth in the investigation of the Welle River region, and he also traveled from this point by way of Lake Albert to Zanzibar.

LOUIS GUSTAV BINGER went into Africa through Senegal and at first devoted his attention to the region that lay to the south of the Niger. He traced the watershed between the Niger and the Volta rivers, and carried out extensive explorations in the southern Sudan and determined the boundary between the Gold Coast and the Ivory Coast.

JEAN BAPTISTE MARCHAND just before the close of the century made a complete crossing of Africa from the mouth of the Congo to the Gulf of Aden. From the Congo he followed up the Welle River and reached Fashoda, where he was involved in Kitchener's campaign in that region. He made his later movement eastward by way of the Sobat River.

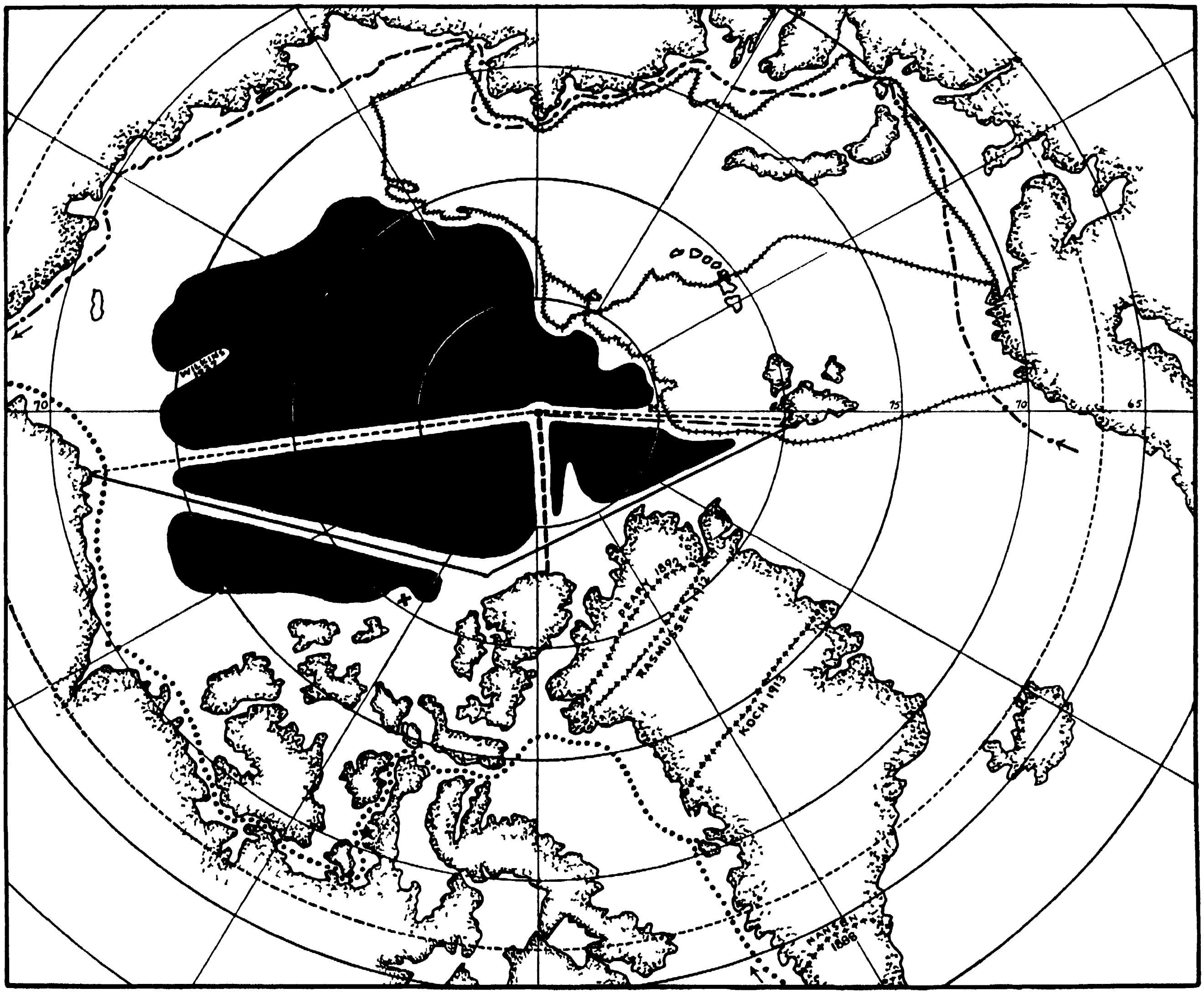


OTHERS IN AFRICA

(1) *Rohlfs* in Northern Africa, 1862-78 (2) *Nachtigal* by Tibesti country to Lake Chad and the Nile Valley (3) *Schweinfurth*, to the Welle River, 1870 (4) *Junker* to Niam Niama, 1879-86 (5) *Cameron* across Africa, 1874. (6) *Binger*, 1887-92 (7) *Marchand*, Congo mouth to Jibuti, 1898.

PART IX

THE ARCTIC AND THE ANTARCTIC



EXPLORATIONS IN THE ARCTIC

— — — —	Nordenskjold, 1878-79	———————	Byrd, 1926
+++++++++++++++	Nansen, "Fram," 1893-96	———————	Wilkins, 1928
— — — — —	Peary, 1908-09	×	Stefansson's Farthest
. . . . . .	Amundsen, 1903-06	★	North Magnetic Pole
- - - - - - - - -	Amundsen-Ellsworth, 1926		

THE ARCTIC

WHEN Alfred the Great was king of England, he told the strange story of Ohthere (Ottar) (about 870), the old Norse sea captain who made a voyage north to a far country where there were lofty mountains crowned with snow tumbling into the sea, of a land where there was sun all the time or no sun at all. He told how Ohthere had sailed around a great cape in the north and found a sea that trended eastward and how he had gone among strange people.

Now, others no doubt had sailed around the North and found a sea that trended eastward and had come into the White Sea. It was a long passage for that time and among new people, and a stirring story he brought back with him. It represents one of the earliest efforts of the people of Europe to reach high latitudes. In the press of business or wars it was forgotten and men saw no profit in rivaling his hardihood.

To the Norsemen, of course, the fjords and capes and even ice in the sea were no novelty. About the time that the dragon ships were driving to America a Norseman had an idea that when the summer sailors slid their ships across the shingle beaches and took the wave, with the oars all flashing, and passed beyond the outer skerries and set their sail for Erin or for Iceland, he too would take a ship on a new errand. Where they sailed west or south he would go north. It was one sea they sailed on and if there were lands to the west there might be lands to the north and no one knew where the sea ended. This man was Harald Hardrada and the year was 1050 and he pushed out from the Norwegian fjord and went northward until he left the land behind and, with the summer's sun circling above him, drove ever north. Then the sun darkened and he felt he was reaching the very end of the sea. And he came among storms and was driven back. It is possible that he passed into the White Sea and made some effort here to strengthen trade, for the people that he met had skins to barter. At least when he came home he had a new story to tell and the story passed beyond his own people, for Adam of Bremen heard it and the old monk set it down in his chronicle of all the things that were important from year to year.

Hardrada had satisfied his curiosity and later the fur trade developed along the coast. But at least, so far as the record goes, the northern seas were vacant. No ship under sail or oars troubled them, and the white bears and the sea birds swam and flew about the empty ocean. There was no driving force to carry men northward.

Then a new idea spread among the people of Europe. The Orient was discovered and the first people to reach that land by sea were the Portuguese who sailed from the southern extremity of the continent south. The idea was infectious, for it was charged with poetry and romance. It promised wealth and the very life and breath of national trade. It spread to Spain and France and England and launched European ships to sail on all the seas of the world. From the time that idea gained foothold, year after year vessels sought the northern seas. Hardly a decade has passed but what some effort has been made to find a new passage in northern waters, for toward the Poles the continents crowd together and there on great circle courses distances are short. Even today when ships have dropped their oars and taken to sail and dropped their sail and taken to steam and oil—even when they have sprouted wings and left the water—we are still exploring the Arctic seas for passages between the continents. Amundsen in the "Norge," and Wilkins and Eielson are the blood brothers of Barents and Hudson.

The English were the first definitely to develop the idea of reaching the Orient by an Arctic passage. We may remember that it was the merchants of the port of Bristol who sent the first English ships into the "Western Ocean" and it was from Bristol that John Cabot made his first crossing to Canada before the beginning of the 16th century. Twenty-seven years of the new century went by and the interests of the merchants were not daunted by temporary reverses. Then Robert Thorne made a definite proposal that English ships should be sent into the Arctic Sea to find a passage to Tartary and Cathay. Sebastian Cabot, the son of John, was still alive, having made passages to America and having seen the extent of the great continent that lay to the westward. He had seen many men fail to find a westward passage and it seemed to him that there was wisdom in trying a passage over the northern seas. He was an old man and no longer able to sail, but he was reputed to be wise in the structure of the world and the way of the sea. He helped organize a company that bore the most romantic title ever devised for a commercial adventure. It was called, "The Mystery Company and Fellowship of Merchant Adventurers for the Discovery of Unknown Lands."

The company was wealthy—why should it not be with such a title—and by 1552 it had organized and equipped at great expense three vessels for a northern venture which left in 1553. Of the two leading ships one was commanded by Sir Hugh Willoughby and the other by Richard Chancellor. Sebastian Cabot came aboard to see the voyagers off and left them his best instructions about the undertaking. The King provided them with letters to the princes of the East.

They sailed well enough in company across the North Sea and followed up the coast of Norway. In the sea beyond the great cape a severe storm fell on them and the ships were driven apart. Willoughby's vessel appears to have suffered greatly, to have reached Novaya Zemlya, and to have come at last to the coast of Lapland where it was held in the winter ice and where Willoughby and all his crew perished of starvation and cold. Chancellor returned to the coast of Norway and the third ship was never heard of again.

Though he had lost the company with which he sailed, Chancellor determined to carry out his exploration alone as far as possible. He turned eastward, following the shore of the Kola Peninsula, crossing the White Sea and landing somewhere on Russian shores. He was much impressed with the continual summer daylight and with the distance he had come beyond the known world. Nevertheless he determined to get what commercial advantage he could out of his voyage. He communicated with the natives of this land, which he knew of as Moscovy, and was well received by them. He started across the land but the report of his travels preceded him and he was invited to Moscow to talk with the Czar. Chancellor brought back to England a great deal of information. But he could bring little news of progress in the Northeast Passage and no return on the money invested in the enterprise. But the company was continued and after this time was generally known as the Muscovy Company.

Stephen Burrough, who had sailed with Chancellor, was given a ship of his own to command in 1556. He made a good passage to the Kola River and he fell in with Russian fishermen and in their company continued eastward as far as the Island of Vaigach, which lies between Novaya Zemlya and the mainland. Here he saw the Samoyedes and described their peculiar method of life: their skin tents, their light skin boats and sledges, their dependence upon the reindeer for transportation and for food. He wished to go farther, but the strong gales from the north and northeast and the snow and ice and the shortening days as fall drew on made him turn back. He wintered on the Kola Peninsula, hoping to continue his voyage eastward the next summer, but was forced to return to England instead.

In 1580 two new navigators, Arthur Pet and Charles Jackman, sailed northward from England in two small ships, the "George" of 40 tons and the "William" of 20 tons. The vessels were separated after they had passed the North Cape. Pet reached Novaya Zemlya and followed its west-end coast until he came to Vaigach Island where he found Jackman's little vessel. Together they tried to round Novaya Zemlya by passing to the northward, but were blocked by the ice. On their way home the vessels were separated again. Jackman is supposed to have reached a port in Norway, to have set out early the next year, but he never returned. Pet reached the North Cape successfully and was back in England by the end of September. The English company continued to try northern ventures but in the meantime an interest in northern routes to Russia and the Orient had grown up in Holland and the Dutch made the next succession of daring voyages.

Linschoten, the young boy from the small town of Enkhuysen who had already made the passage to India with the Portuguese, gave the impetus that started off this series of voyages and Enkhuysen merchants provided the capital. The Dutch government assisted in the enterprise and sent a vessel, and the merchants of Amsterdam sent out two ships in which William Barentzoon was chief pilot. He became such a famous sailor that his name has become anglicized and is known as Barents or Barentz. Linschoten himself sailed with the vessels from Enkhuysen. Barents reached Novaya Zemlya and sailed to Vaigach Island and there met the ships of Linschoten who had penetrated the Kara Sea. The vessels returned home. This was in 1594. In the next year Linschoten encouraged the government to fit out an expedition of seven ships and they sailed again a little way into the Kara Sea but returned with no progress to report.

William Barents (died 1597) and the First Arctic Winter

THE States-General were discouraged and would provide no more direct money for the Northeast Passage but they offered a prize for the first ships to reach the East by this route. The Amsterdam merchants determined to keep on with their effort and equipped two vessels to make a further attempt in the year 1596. One ship was under the command of Jan Cornelis-zoon de Ryp (Rijp). Barents was named only as the chief pilot and sailed with Heemskerk's vessel. Possibly the merchants thought him too daring and reckless. Yet he was really the experienced man; his was the steadiness, and to him the expedition looked for help in time of trouble.

When they passed North Cape, Ryp and Barents disagreed as to their course. Barents wanted to turn westward and Ryp wanted to hold on. Barents yielded and they sailed north until they discovered a small island where they killed a polar bear and for this reason named it Bear Island. They held on and discovered a land where lofty, ice-encrusted mountains rose sheer out of the sea. They sailed partly about the island and christened it Spitsbergen, the land of the tall peaks, and thought it was a part of Greenland. They returned to Bear Island and here they disagreed again and parted company. Barents turned eastward to Novaya Zemlya, as he had intended, named and rounded Icy Cape, its northernmost extremity, and tried to force his ship southward but was soon surrounded in the ice-pack.

Here commences the remarkable story of the first winter that Europeans spent in the Arctic. It is so characteristic of all Polar exploration, it has so many features that are common to a score of stories, that its details are worthy of attention. The story of the whole trip is preserved in the record of one De Veer who was the surgeon-barber of the expedition.

For days the ship made a brave struggle to get free of the ice, the men cutting, prying and pushing to clear a way through the floes. But it was of no avail. The ship was tossed and buffeted in the moving pack and finally froze fast. The men turned to the land and prepared to build winter quarters ashore. They had not really prepared for this eventuality and they had to make the most of what stores they had and the best use they could of what tools they had brought with them. The island was completely barren but fortunately they found an accumulation of driftwood that had been cast on the beach by currents running from the Siberian coast.

They sawed the lumber and fashioned planks and set up a house according to directions given by the ship's carpenter. Unfortunately, after a week or so of work, the carpenter died and the rest had to carry on as best they could. The house was built as solid and tight as they could make it, with one door and a fireplace in the middle of the house and in the roof a chimney improvised out of barrels. The boards were caulked according to the ways of shipbuilders, but even so, when the winter gales came leaks developed. The roof was formed by a sail taken from the ship, stretched on a frame, and covered with a light coating of sand; and presently the snow added another layer and the whole mass froze solid and served very well until the spring thaws came. Bunks were built along the side of the house and stores from the ship moved in.

All this was not done without difficulty and delay. Though the whole party maintained a remarkably good morale, there was dismay in many hearts as the winter days drew on and the cold increased. The hungry polar bears of the island gave the Dutchmen the greatest difficulty. They attacked the men and plundered the stores and, with the primitive arms at the men's disposal, it was no easy matter to kill one of the great creatures. At one time a hungry bear kept several men imprisoned on the ship and cut off from the rest of the party on the shore. Bears and foxes were killed throughout the fall, their skins were used for bedding and clothing and their meat preserved to add to the meager food supplies.

The sun sank lower and lower and presently a day arrived when it failed to rise at all. While the arctic gales howled, the men shut themselves up in their house, tended the fire and fashioned rude garments out of the skins of the animals they had killed. With the coming of the real cold the bears troubled them no more, for they were hibernating. But the men emerged from the house only to trap foxes and gather firewood. Inside the house they were cold and miserable, yet it is remarkable how good a job they made of their winter wait and how many of the things they did have been repeated by subsequent explorers.

Their fire represented the primary condition of life to them and they made a ritual of tending it, though they cursed it for the smoke that often choked them. They had a Dutch pendulum clock which they hung on the wall and which kept the hours for them until it finally weakened and froze up in the intense cold. They had a few books which they read and reread. One of these was Mendoza's *History of China* translated into the Dutch. Barents was studying the country he expected to reach.

No European had been through an arctic winter before, but the men knew they must keep up their spirits and their health. In the fall they had played a kind of hockey, using as a ball the round wooden truck taken from the mast of the ship. In the winter they devised indoor games and in the spring they seem to have played a kind of primitive golf. It is quite likely that this still represents the farthest north for the game! De Veer, the surgeon, was a jolly fellow and organized amateur theatricals. He also thought it was hygienic for them to keep as clean as possible. They made a tub out of an old cask and every week each man in the party had at least one steam bath. They kept time more or less by guess-work, but about New Year's Day, after a tremendous blizzard, they had a feast with speech-making and ate hot pancakes and rusks dipped in wine.

Of course they wearied of salt-food and of fox-stew and they suffered badly from scurvy, Barents being one of those most seriously ill. In the darkness the storm howled and the foxes scratched on the roof and kept all hands awake with their sharp and bitter barking.

One day Heemskerk, crawling out of doors, saw a gleam of light. The sun had come back! He gave a yell and the others came running and crawling to join him. They were off in their calculations and nobody had expected the sun for another two weeks. They were happy and grinned, but the wavering light fell upon forms that were shrunken with famine and on features bloated with scurvy. With the return of the light the bears came crawling out, hungry from their winter nap, and made more trouble for the camp than ever. For a while there was hope that the ship might be freed from the ice-pack but as she drifted farther from the land and suffered increasing injuries and was still locked fast, this hope vanished. The small boats that had been drawn up ashore were gradually dug out of the ice and snow. They had suffered seriously but were repaired with timbers from the abandoned ship. At last, in the middle of June, the ships were ready. They abandoned their camp and moved their supplies into small boats. Barents was so weak that he had to be carried carefully aboard.

They pushed their way through the narrow, ice-choked channels and rounded the icy cape again and worked their way down the shore of Novaya Zemlya. On the way Barents died and another member of the party with him. Progress in the small and leaky boats was slow and dangerous and they were often delayed by ice, but they made their way to the Russian coast and worked along its shore a total distance of over 1,500 miles until they came at last to the region about Kola and here received entertainment from friendly residents. Hardly had they reached this point when word came to them of a countryman of theirs in the neighborhood. It was Ryp!

After the ships had separated Ryp had brought his vessel to Norway and had finally gone to Holland for the winter. He had now returned to Kola and he took the survivors of the expedition home.

In 1863 Captain Elling Carlsen, an enterprising Norwegian walrus-hunter, made what was probably the first circumnavigation of Spitsbergen, which Barents had discovered. In 1871 this same Carlsen was pursuing his calling near Novaya Zemlya. He came to the eastern shore and there found the camp just as Barents had deserted it. The bunks still lined the wall and the clock hung there. There was the barrel bath-tub and even the copy of Mendoza's *China,* a pathetic memorial to a great hope. Captain Carlsen collected all these things and took them away with him and later sold them to the Dutch government and they rest today in the naval museum of The Hague, in a reconstruction of the house exactly as it appeared in the early engravings which were part of De Veer's account.

JOHN DAVIS (1550?-1605)

AFTER Barents's time sporadic efforts were made at the Northeast Passage but without much success. Some trading voyages were made to the Arctic coast of Russia and hunting expeditions went into the waters that Barents had navigated.

In the meantime the trend of exploration swung westward and the chief attention was directed to the Northwest Passage. We have spoken already of the work of Frobisher and Hudson because their names are directly connected with discoveries in the American continent. To their names we should now add that of John Davis, a courageous and enterprising English seaman who made three voyages in the American Arctic. In 1585 he sailed to Greenland, arriving first on the east coast, circling its southern extremity and visiting the west coast as far as Gilbert Sound (Godthaab). He made another voyage in 1586 which added nothing to the known territory. But on a third voyage in 1587 he reached 72° 41′ N. and explored both sides of the strait that bears his name. As a matter of fact Davis Strait, at least in its southern portion, had been frequently crossed from the time of the Norse settlements on.

Sir Thomas Button in 1612 intended to develop the Northwest Passage. He entered Hudson Bay, wintered at the mouth of the Nelson River, where one of his officers, for whom the river was named, died. In the spring he passed by the shore of Southampton Island and returned home.

In 1631 two British ships on a similar errand to that of Button met each other in the middle of Hudson Bay. Foxe explored the west side of Hudson Bay and returned home. James passed the winter in the extension of Hudson Bay that now bears his name.

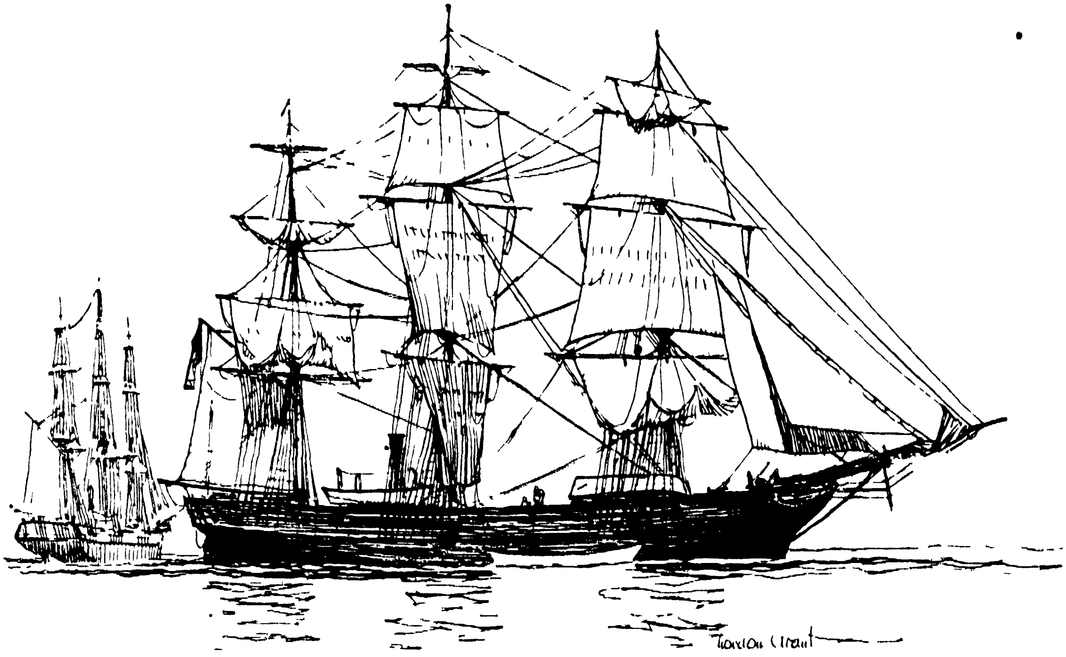
Not much progress was made in Arctic travel until 1806 when William Scoresby, a whaling captain, in a voyage near Greenland drove his ship as far as 81° N. He returned with a valuable series of scientific observations. In 1822 he succeeded in reaching the east coast of Greenland in latitude 75° N. and made a careful examination of its coast for over 400 miles southward.

In the meantime, in 1818, Lieutenant Edward Parry had commenced a series of valuable explorations among the American Arctic islands, in this year carrying out a voyage in Baffin Bay. On another voyage in the following year he passed through Lancaster Sound and discovered and named Barrow Strait. He passed through Wellington Channel and reached Melville Island, where the ice-pack caught him and he was forced to winter on its southern coast. He returned in October of 1820 with real additions to the geography of this region.

He returned to Melville Peninsula in 1821, wintered among the Eskimo in 69° 20′ N. at Igloolik and in the next season, before returning home, discovered and named Fury and Hecla Strait. Parry's final voyage was connected with the work of exploration that was being carried out about this time by Sir John Franklin.

SIR JOHN FRANKLIN (1786-1847)

IN 1818 Franklin, as a young lieutenant, together with Captain David Buchan, made an attempt to get north in the region of Spitsbergen but were turned back by bad weather. The next year Franklin tried a land expedition in Canada. On this trip he was accompanied by George Back, Robert Hood and Dr. John Richardson. This party landed at York Factory at Hudson Bay, went to the Great Slave Lake and then followed the course of the Coppermine River, which Hearne had already followed. From the mouth of the Coppermine the party turned westward, exploring over 500 miles of the Arctic



THE "EREBUS" AND "TERROR"

THESE are among the most famous of the great ships of exploration. The "Erebus" was an old naval bomb ship very heavily built for this purpose. Her burden was 370 tons. The "Terror" was about the same size—340 tons.

In 1836 the "Terror" was used by Captain Back in part of an attempt on the Northwest Passage. She was caught in the ice about Hudson Bay and for ten months was badly battered. Back freed her and ran for England in an all but sinking condition. He saved his vessel by running her aground on the Irish coast.

She was repaired and refitted and with the "Erebus" was used by Sir James Ross in the Antarctic in the years 1840-1843. Ross discovered and named after his two ships the great volcanic peaks, Mount Erebus and Mount Terror.

Sir John Franklin took over the vessels from Ross and used them on his ill-fated attempt on the Northwest Passage. They survived one winter at Beechey Island. The second winter they stuck in the ice in latitude 70° 5′ N. and 98° 23′ W. Sir John Franklin died and his men trying to reach the American mainland all perished. Many relief expeditions were organized. It was not until 1857 that their fate was known.

coast of America until they reached Cape Turnagain. They arrived back safely but in an almost starving condition, having undergone great hardships. Now a nice problem presented itself. Franklin had opened up a great length of coast line in the center of the American continent. The voyages of Bering and of Cook through Bering Strait had defined the western tip of Arctic America. Parry's recent travels had greatly extended the knowledge of the eastern approaches.

It seemed time in 1825-1826 for a concerted attack on these regions in an effort to link up the known coasts by sea and thus to discover a northward passage about America, if such existed. It was Parry's part in this enterprise to take his ship to Lancaster Sound and proceed through Prince Regent Inlet. Parry did not succeed in carrying out his part of the plan. Franklin, however, descended the Mackenzie to its mouth, as planned, and added 370 miles of known coast line from the mouth of the Mackenzie westward. His associate, Richardson, followed the coast from the Mackenzie to the Coppermine. Captain Beechey had been sent in a vessel to enter the Arctic Ocean through Bering Strait and worked eastward. He followed the coast line as far as Point Barrow in Alaska in 71° 23′ N. latitude. The only part of the Arctic coast which was now unknown was the section between Point Barrow and the most westerly point of Franklin's advance.

Franklin, when he returned to England in 1826, was already a man with a distinguished record of exploration to his credit, a record that had called him to the attention of the political powers. Time went on. In the course of affairs he was called upon to serve as governor of Tasmania. It looked for a while as though he were withdrawn permanently from the field of exploration. He was simply an effective governor carrying on his duties in an out-of-the-way corner of the empire. Yet even in Tasmania he was not altogether out of contact with what was going on in the field of exploration, for James Clark Ross came here with his ships, the "Erebus" and "Terror," when he was preparing his Antarctic voyage. Of course Franklin and Ross had good times together and Franklin did all he could to make the outfitting of the ships a success.

After seven years of service, Franklin returned to England to find that the Royal Geographical Society was unusually active in fostering an expedition to complete the survey of the Arctic coast of America and to force a way through the Northwest Passage. Ross was back from his new discoveries in the Antarctic and this stimulated interest. Franklin's own return added to the general enthusiasm. Franklin was then 59 years old and the portraits that have been preserved of him show a dignified, robust, but not corpulent figure. Looking at the portrait it would be hard to reconstruct the younger man who had gone through the hardships and privations of the many hundreds of miles of travel along the Canadian rivers and Arctic coasts, were it not for the alert carriage of the figure and a certain brilliance in the eye that still suggest the young midshipman who rendered such effective service at the battle at Copenhagen and Trafalgar. Despite his years, Franklin was the man to lead the great expedition. Neither the geographers nor the general public had forgotten his work in Canada. Franklin would not apply for duty, he would not force himself into the situation, but when he was appointed he accepted the responsibility with all his old enthusiasm.

The "Erebus" and "Terror" were repaired and recommissioned. Small steam-engines were installed. In 1845 the ships were ready. A party of 129 persons was enlisted for the voyage and the ships were provisioned for the full company for a period of a little over three years. In the company that sailed with Franklin were Crozier, who had sailed with Parry on three voyages and who had also served with Ross; Gore, who had been with Ross; and Back, who had discovered the Great Fish River in the northwest of the Hudson Bay region and who had been a member of Franklin's earlier expeditions. The party sailed with the brightest of prospects before it.

From Whale Fish Islands on July 12, 1845, Franklin sent back a letter to the Admiralty but the letter contained no very important information, and it did not indicate what course Franklin meant to pursue. Some two weeks later a whaling captain named Dannett sighted the "Erebus" and "Terror." They were moored to an iceberg 74° 40′ N., 66° 13′ W. They were apparently waiting for an opening in the ice to cross the Lancaster Sound.

This was the last that was ever seen of any member of the expedition or of the ships. What happened to them is all conjecture and reconstruction. It is probable that Franklin went by Lancaster Sound, that he found Barrow Strait choked with ice and ascended Wellington Channel. Some think that he passed through McClintock Strait, west of Prince of Wales Land, while others believe that he went by way of Peel Sound down Franklin Strait and along North Somerset and Boothia. By whatever way Franklin passed, it is certain that he reached Victoria Strait, that the ships were caught here in the ice in September, 1846. The ships could not free themselves and spent the winter of 1846-1847 here.

We know this much because McClintock and his party 12 years later reached Point Victory where Ross in 1831 had built a cairn. Here McClintock found the following note:

"28 of May, 1847   H. M. Ships Erebus and Terror
Wintered in the Ice in
Lat. 70° N. Long. 98° 23 W.

Having wintered in 1846-7 at Beechey Island in Lat. 74° 43′ 28″ N. Long. 91° 39′ 15″ W. After having ascended Wellington Channel to Lat. 77° and returned by the west side of Cornwallis Island.

Sir John Franklin commanding the Expedition

All well

Party consisting of 2 officers and 6 men left the ships on Monday 24th May 1847

GM. GORE, *Lieut.*
CHAS. F. DES VOEUX, *Mate.*"

This message seemes to contain an error since it was the winter of 1845-1846 that was spent at Beechey Island and the winter of 1846-1847 that they were beset in the ice. It seems that in the winter of 1846-1847, though the ships were making no progress, nothing very serious was happening and that Gore was out reconnoitering.

But a further message had been added on the margin of Gore's entry:

"'April 25, 1848—H. M. Ships *Terror* and *Erebus* were deserted on the 22nd of April, 5 leagues N.N.W. of this, having been beset since 12th September, 1846. The officers and crews, consisting of 105 souls, under the command of Capt. F. R. M. Crozier, landed in latitude 69° 37′ 42″ N., longitude 98° 41′ W. This paper was found by Lt. Irving, under the cairn supposed to have been built by Sir James Ross, in 1831, 4 miles to the northward, where it had been deposited by the Commander Gore, in June, 1847. Sir James Ross' pillar had not, however, been found; and the paper has been transferred to this position, which is that in which Sir James Ross' pillar was erected. Sir John Franklin died on the 11th June, 1847, and the total loss by death in the Expedition has been to this date 9 officers and 15 men.

"'F. R. M. CROZIER, *Captain and Senior Officer*
"'JAMES FITZJAMES, *Captain H. M. S. Erebus*

"'And start on to-morrow, 26th, for Back's Fish River.'"

So all that we positively know is that the ships had been caught in the ice for a year and a half without being able to free themselves; that they had moved in the pack for a distance of about

19 miles; that the first winter in the ice had gone by without difficulty; that Franklin had died in the spring and that in the second winter 9 officers and 15 men had died. We know that the ships had been abandoned and that the surviving officers and men had counted on saving themselves by making a passage to the Canadian mainland.

Later expeditions found a few relics of the expedition and the skeleton of one of the party that had deserted the ships. An old Eskimo woman said that she had seen the party fleeing southward and that "they fell down and died as they walked along." When all the meager information is collated, it appears that the straggling party passed over King William Island in an effort to reach the mainland near Back's Great Fish River, the men dying in different places along the route from starvation and scurvy.

In view of the part that exhaustion of supplies and starvation seems to have played in the disaster to the Franklin party and in the death of so many men, I take the liberty, even in this condensed account, of calling attention to a matter that is not very well known or very frequently mentioned in the accounts of Franklin's expedition. On page 246 of W. H. Markham's *Life of Sir John Franklin* there is a footnote in small type slipped into an account of other matters. This footnote is full of interest:

> "At Franklin's winter quarters [Beechey Island] were found several heaps consisting of preserved meat tins filled with gravel, raised to a height of two feet, and varying in breadth from three to four yards.
>
> "Dr. Sutherland computed the number of these tins to be about 700, while many more were also found scattered about during the search for records. These tins were labelled 'Goldner's patent' and had been supplied, under directions from the Admiralty, to the expedition as 'preserved meat.' From the fact that an enormous quantity of these tins supplied to the navy, were subsequently found to contain putrid meat, and from the fact that so large a quantity of meat as these empty tins were calculated to hold, could not have been used by the members of the expedition during their first winter, it is supposed that the defective condition of the contents of the tins was discovered, and a survey of them ordered. If this surmise be a correct one, the loss of so large a proportion of what would be considered fresh, in contradistinction to salt, provisions would be most serious, and would so cripple their resources, as to lead in all probability to the disastrous fate of the expedition."

In Search of Franklin

In England, aside from Franklin's own letter and the report from the whaler, nothing was known of what had become of the Franklin expedition for many years. It had been anticipated that the expedition would be a lengthy one and everyone was prepared to wait for several years before hearing from the party. But as the years passed alarm grew and a number of searching and relief expeditions were organized to get in touch with the Franklin party. These search expeditions were for a while completely unsuccessful in bringing back news of the Franklin party but as they went on from year to year they greatly stimulated interest in Arctic America. They pushed into a number of hitherto unknown regions and added thousands of miles of coast line to the map.

It is a curious and ironical circumstance that in the spring of 1847, when Franklin's ships were caught in the ice off the west coast of Boothia between Point Victory and Cape Herschel about the time that Gore was setting off to plant his note, an Englishman named Rae was exploring the Boothia Peninsula. He was less than 150 miles from the point reached by Gore's party. Had they succeeded in getting in touch with each other, Franklin's whole expedition might have been rescued. Rae was one of those who continued the search for the Franklin party. Rae conducted his searches by approaching the north overland and so did C. F. Hall. McClintock, Collinson, and McClure were among those who led expeditions by sea.

Of the expeditions by sea, McClure's was one of the most notable. Assuming that Franklin had succeeded in working his ships a considerable distance westward, McClure took his ship, the "Investigator," through Bering Strait and began working eastward in the Arctic Sea. The vessel was caught in the ice and frozen fast when she was north of Banks Island. McClure abandoned the vessel and commenced traveling over the ice with sledges. He eventually came in touch with a part of the squadron of searching vessels operating from the east. Sir Edward Belcher and these ships brought him back to England. McClure certainly crossed Arctic America; his travel added something to geographic knowledge and represents a performance marked by endurance, courage and resource. But since he unfortunately had to abandon his ship there is little point in the suggestion which has been made that he completed a northwest passage.

In 1848 Sir James Ross led a search expedition from Baffin Bay in which Leopold McClintock gained his first Arctic experience. In 1850 McClintock served with an expedition under Captain H. T. Austin. In the search this year W. Penny, a whaler, joined. This expedition is reported to have been exceptionally well conducted, cheerful and healthy. The combined sledge journeys are said to have covered over 7,000 miles, of which 1,200 miles represented new territory. This included parts of Cornwallis Island, Russell Island, Bathurst Island and Melville Island.

It was also in this year that the American expedition under E. J. de Haven joined the search. His ships drifted over 1,000 miles in the ice and the party explored Wellington Channel and discovered and named Grinnell Land.

In 1851 Rae went down the Coppermine River, crossed Wollaston Land and examined Victoria Land. From the Eskimos he heard rumors regarding Franklin's party. This was the first definite clue.

A large expedition under Sir Edward Belcher, in which McClintock joined, was out in 1852. McClintock in this year covered 1,400 miles, 700 miles of it new territory, while another member of the expedition, Mecham, covered 1,100 miles, of which 785 were previously unknown.

Rae was back in the Boothia Peninsula in 1854 and here he came across relics of the Franklin expedition which definitely identified the place where the fugitives from the "Erebus" and "Terror" had landed. The government decided that this was all the information they required and gave up further search. But Lady Franklin refused to give up and in 1857 organized an expedition to go out under McClintock in the "Fox." It was a member of this expedition who 12 years after the disaster found the note we have quoted regarding the fate of the ships. It was another 7 years before C. F. Hall found among the Eskimos further information about the flight of the "white men" from the ships. He talked with one Eskimo who claimed that he had seen Franklin. So the melancholy record of the expedition was closed. In the meantime scores of men had been educated in Arctic travel and had learned how to live in the north. Over 7,000 miles of coast line had been discovered and a new map of Arctic America was the result.

BARON NILS ADOLF ERIK NORDENSKIÖLD (1832-1901)—THE NORTHEAST PASSAGE

BARON NILS ADOLF ERIK NORDENSKIÖLD was the final conqueror of the Northeast Passage.

Nordenskiöld was a Finn by birth and education. He was a good scholar, an energetic and aggressive young man whose opinions were often too liberal and freely spoken to suit the tastes of the university and political authorities of the Helsingfors of those days. Nordenskiöld's travels and his scientific work gradually brought him more and more in touch with the people of Sweden and it was finally a Swedish expedition which he took on his long voyage.

Nordenskiöld had begun his exploratory work with a voyage to Greenland in 1870 when he had made one of the first attempts to advance on the Greenland ice-cap. At this time he reached an elevation of 2,200 feet but was not able to travel much more than 30 miles. Still, his trip reveals something of the character of inner Greenland.

Nordenskiöld continued to travel extensively in Greenland and Spitsbergen, on one occasion advancing 75 miles. In 1875, however, he turned his attention to the question of a northeast passage. With the assistance of Baron Oscar Dickson of Gothenburg he secured a ship and made a successful passage to the mouth of the Yenisei and named the harbor there Port Dickson.

As a result of this trip Nordenskiöld believed that the completion of the Northeast Passage was easily within the realm of possibility. Again he had the support of Baron Dickson and of other citizens of Gothenburg. In 1878 the ship "Vega" was purchased for Nordenskiöld's use. He assembled a group of international scientists and officers and sailed from Gothenburg in the early summer. The vessel was good and the party carefully organized and the preliminary work skillfully carried out. It is a tribute to Nordenskiöld's leadership that he carried through with apparent ease and without hardship and disaster a passage on which so many explorers had met defeat and death.

The "Vega," accompanied by another ship, the "Lena," passed rapidly around Norway and the North Cape and from there it crossed the White Sea through Yugor Strait and the Kara Sea. The vessels anchored in Dickson Harbor. They rounded Cape Chelyuskin August 19th, and later, according to plan, the "Lena" ceased to be an escorting vessel and proceeded up the Lena River. The "Vega" was favored by a rather open season. She occasionally encountered fog and ice and adverse winds and this was particularly true in her passage around the Taimir Peninsula and Cape Chelyuskin. Here progress on the whole was so good that in September it seemed likely she would be able to reach Bering Strait before the ice closed in and thus complete the Northeast Passage in a single season. She had almost reached the real goal when progress became increasingly difficult and she was finally frozen in on September 28th. The party was well prepared for the winter and during the long wait carried out a number of scientific studies.

However, for 294 days the vessel was held fast in the ice, until July 18th of the following year. The "Vega" then sailed through Bering Strait, ran to the Alaskan coast and reached Bering Island in mid-August, having accomplished a voyage that men had been striving to carry out for nearly 350 years.

The "Vega" continued her trip, stopping at Yokohama, sailing completely around Asia, passing through the Red Sea and Suez Canal and Mediterranean and arriving in Sweden in 1880.

As a result of Nordenskiöld's adventure many believed that with different types of ships and with a start from the northern port early in the season it would be possible to complete the Northeast Passage in a year and even thought there was hope of developing a northern commercial route. The Soviet government is now trying to substantiate this hope.

FRIDTJOF NANSEN (1861-1930)—FARTHEST NORTH

THE first important advance on the North Pole was made by that genius of Arctic exploration, Fridtjof Nansen, on his expedition in the "Fram" which sailed from Norway in 1893. Up to this time, though much courageous work and some desperate work had been done in connection with the Northeast and Northwest passages and though the Arctic lands had been often skirted, no one had pushed into the Arctic ice or made a long march over it northward.

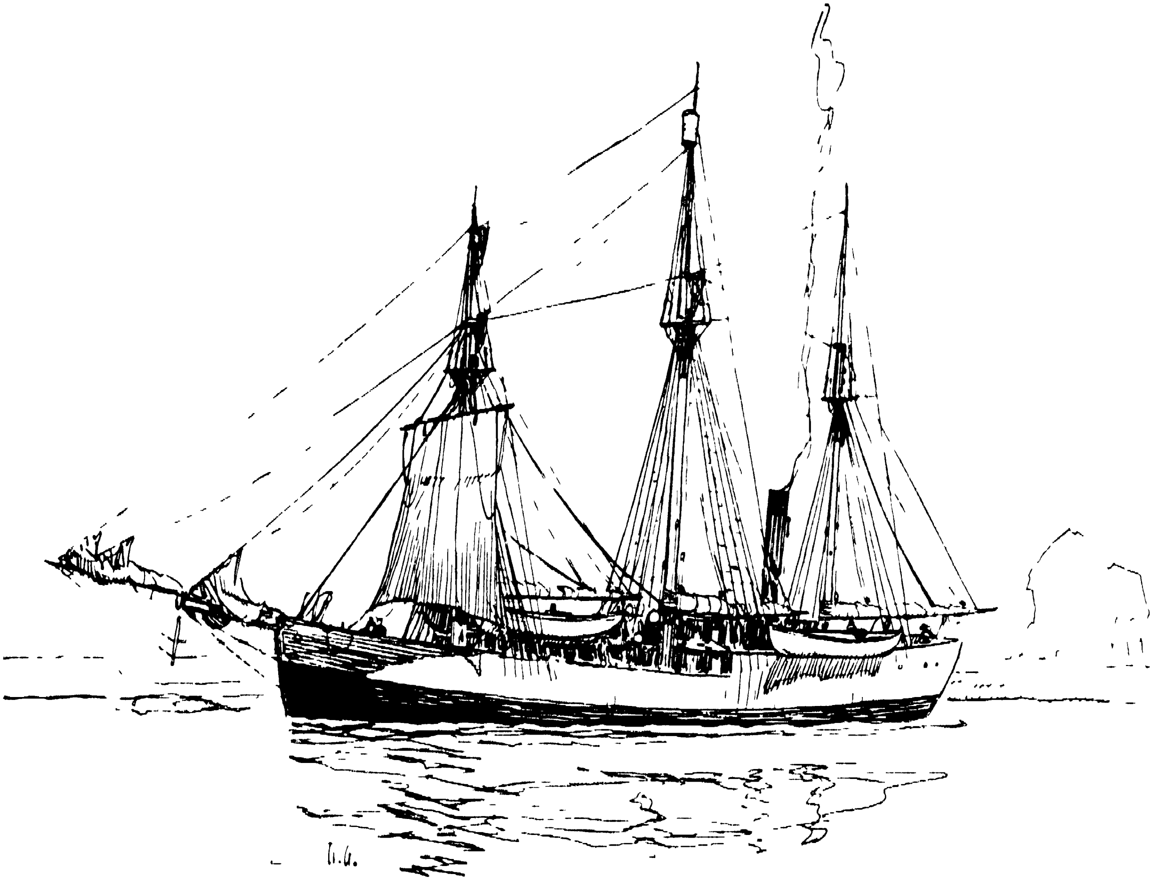
At the time Nansen began his great enterprise, he was only 32 years old, but he had already been developing his plans for a period of over 9 years. He had grown up in Oslo (then Christiania) and had studied at the University, specializing in zoölogy there and at the famous marine zoölogical station at Naples. Tall, strong, an out-of-doors man and a sportsman, Nansen had begun to make Arctic voyages while he was still a student. In 1882 he traveled to Greenland in the sealing ship "Viking." He followed this in 1888 by making the first crossing of Greenland. On this trip he had with him Otto Sverdrup who later became the captain of the "Fram" and the second in command of the expedition. On this crossing, the party attained an altitude of 8,920 feet and revealed clearly the character of interior Greenland. Perhaps the most important effect of this expedition was that it also revealed Nansen's extraordinary strength and endurance and his capacity both as a leader and scientist. The expedition had been obliged to winter at Godthaab, and Nansen used this time to carry out studies of the Eskimo population and to produce his book, *Eskimo Life*. When he returned to Oslo, he married Eva Sars, the daughter of Professor Michael Sars. His marriage did as much to stimulate his plans as to restrain them, and soon he turned in earnest to the promotion of his venture on the Pole.

Nansen's whole plan for Polar exploration was revolutionary in character and he had many battles to fight before he could even proceed with the organization of his expedition. Briefly, his plan was to build a ship, to sail her on the Northeast Passage across the top of Siberia beyond Cape Chelyuskin, to freeze her in the ice and let the drift of the Arctic pack carry her toward the Pole. When the ship had reached a high latitude, Nansen planned to make a journey over the ice to the Pole itself. He planned not to attempt to rejoin his ship but to return to Spitsbergen and count on picking up another vessel there.

Now all this was rank heresy to the majority of Polar travelers of the time. The scheme when it was first proposed was regarded as a very elaborate form of suicide. It had not been demonstrated that a ship could be built that would resist the tremendous pressure of the Arctic ice pack. Everyone thought that an Arctic vessel for its own protection must stay near the land. Most reputable oceanographers doubted the existence of the Polar currents that Nansen so firmly believed in. It was characteristic of Nansen that after careful study he made a bold announcement of his plan and even journeyed to England to appear before the Royal Geographical Society to present the plan in full and to face his critics.

The proposal to freeze the ship in the ice and to abandon it to the ocean currents sounds even today like a harebrained scheme. It was in fact based on close observation and careful reasoning, supported by unusual personal courage. Like many successful plans, it was based on the study of another man's disaster.

There had been an American Arctic expedition in 1879-1881. This expedition was commanded by George W. De Long, a retired lieu-



THE "FRAM"

THE "Fram" was the sturdy vessel of the bold and famous explorer Fridtjof Nansen. He put her through one of the most remarkable experiences that has been the lot of any vessel. She went farther north than any other vessel had ever been or is ever likely to go unless Wilkins succeeds in reaching the Pole by submarine. She sailed from Christiania (Oslo) in June, 1893. She rounded the North Cape and sailed north and east until in September she was intentionally frozen fast in the ice north of Central Siberia. She drifted with the ice-pack until she finally reached 85° 57′ N. She freed herself from the ice-pack and returned to Norway in 1896 after a voyage of three years.

The "Fram" was also used by Amundsen on his trip to the South Pole in 1911 and then reached the record for a vessel south, 78° 41′.

The "Fram" was especially built for her work. She was very strongly built and could stand great pressure from the ice. The form of the hull in cross-section was such that she might be squeezed upward on top of the ice rather than be crushed between floes. Her bow, stern and keel were all rounded off in easy curves so that the ice might not get a grip upon her. She had a canoe-like stern or, as we would say today of a small vessel, she was "double-ended." Her keel was 102 ft. in length; on the water-line she was 113 ft. and on deck 128 ft.; her beam, 36 ft. With a light cargo she drew 12½ ft. and displaced 530 tons, but heavily laden, she drew over 15 ft. and displaced 800 tons.

She was rigged as a fore-and-aft schooner but carried also on the foremast two movable yards on which a square foresail and topsail could be set. She had a steam auxiliary engine of about 220 horse-power. This engine was a triple-expansion engine but it could also easily be converted to a compound high-pressure or compound low-pressure system.

tenant-commander of the United States Navy. The expedition was financed by James Gordon Bennett of the New York *Herald*, the man who had also financed Stanley in Africa. De Long's expedition had sailed through Bering Strait in the ship "Jeannette," had entered the ice-pack and been caught in it. De Long expected to make his winter quarters on a large land-mass that had been reported in this area. He found instead only two small islands and a larger island which he named after Bennett. His ship was not built for work in the ice and was crushed and lost. He attempted to lead his men to the Siberian mainland but he and some of his companions died before they reached aid and their bodies were not discovered until 1881. For a while nothing was heard of the "Jeannette."

Some two years later a Danish professor; writing from Greenland, reported seeing a quantity of wreckage along the Greenland shore in addition to timbers and other fragments of a ship. There was found a seaman's cap, a list of supplies signed by De Long and other evidence to show that this was flotsam from the fated American ship. This notice at once attracted Nansen's attention, for he had already commenced the careful study of the Polar Sea which was to occupy so much of his attention in later life. While she was caught in the ice, but before she broke up, the "Jeannette" had drifted from Bering Strait in a northwesterly direction. Nansen argued that she was borne by a persistent current which made headway even against the prevailing northwesterly winds and that a continuation of this current would naturally have carried the wreckage of the "Jeannette" across the sea in the vicinity of the Pole and brought it out at last at Greenland.

He sought further evidence and made an analysis of the driftwood which the Eskimos of Greenland used in the construction of their canoes. There are no growing trees on Greenland and a study of the woods found along the Greenland shore showed that they came from Siberia rather than from the American continent. Cakes of ice from the ice-pack on the shores of Greenland were discovered frequently to have mud frozen in them or attached to their bottoms. Analysis of this sand and mud and of the microscopic animals imbedded in it indicated again that these forms were probably derived from soil swept seaward by the great Siberian rivers. There was other evidence touching on winds and currents. Nansen worked at all this like a detective solving a murder mystery. Out of such scientific clues he built his theory of Polar currents and his plan for the Arctic voyage.

Many of the English explorers were against Nansen, and I am sorry to say that our great American Arctic traveler, General Greely, marred his reputation for courtesy and fair play by attacking Nansen savagely, both before he left and even after he returned from his expedition. But whatever the scientists of other nations may have thought, Norway believed in Nansen and the Storthing voted him three-quarters of the sum needed for his trip. King Oscar helped him from his private funds. Baron Oscar Dickson sent assistance from Sweden and popular subscription provided additional sums. The English Royal Geographical Society showed its sportsmanship and good faith by making an important contribution. Nansen devoted great care to the construction and preparation of the ship and in this he had the incomparable assistance of the great designer, Colin Archer, who produced the "Fram." The closest care was devoted to the selection of men and of equipment. The men were chosen for their strength and physical resistance as well as for their technical attainments. Scientific equipment was carefully planned and a schedule for scientific work arranged. Throughout the trip of the "Fram" observations of many kinds were carried forward, and even when they were drifting in the Arctic pack, soundings were made to the bottom of the Arctic Sea. These were the first important evidence that the North Polar region was a deep sea and that it was unlikely that it contained a large land area.

The expedition sailed in June of 1893. The "Fram" was designed for work in the ice and she was not a handy sailer. In open water she rolled violently so that the early part of the voyage, though not dangerous, was uncomfortable. It was also wet for she was heavily laden. She encountered a less open season and heavier going than Nordenskiöld had found in the "Vega." But Nansen rounded Cape Chelyuskin, worked her farther eastward and finally on September 22, 1893, in latitude 78° 50′ N., 133° 37′ E., ran her into the ice and let her freeze.

Archer and Nansen were right. The ship took the pressure perfectly. When the ice closed the "Fram" was lifted up. When pressure was relieved she settled in the clear water on an even keel. With a terrific roaring and cracking that sounded like artillery fire, the great floes would squeeze the hull. The din inside the ship was frequently unbearable and the pressure came not once but a score of times over a period of weeks. She was lifted and set down again. This happened particularly at spring tides and was apparently due in part to the tidal wave so that sometimes she would alter her position four times in 24 hours. But she demonstrated her complete safety. The men grew used to the noise and the routine of life and work went on smoothly. At last the tremendous floes closed under her and she rested on her ice bed. Nansen had proved his first point!

But only his first point. First she moved forward, northward and a little west as Nansen had predicted. Then there were weeks of storm in which she was set farther and farther back and more to the eastward. Both soundings and observations showed she was nearer the Asian continent than when she was first frozen in. Nansen's journal shows that there were moments of doubt and discouragement, though he felt sure his general theory must be right. At last the movement of the pack set in and the "Fram" was borne on its destined course northward and westward, making slow but steady progress. Later there were one or two occasions when the "Fram" was set backward and even described circles. But the tendency was that which Nansen had predicted. And they had time, they were ready to hold out for some years. Nansen had proved his second point!

The drift went on for a year and a half. Nansen felt sure the ship was safe and that she would make steady progress. But it seemed clear that her course would not take her over the Pole. It was March 14, 1895, and they were in latitude 84° N., 101° 55′ E. Nansen said good-by to his men, left the ship in charge of Sverdrup, took Johansen with him as a traveling companion and set out on the dash to the Pole. They were setting off on the first long journey over the unexplored Polar ice-pack, the whole pack drifting as they had demonstrated on the Arctic Ocean. The ship they were leaving was drifting also. They had surveying instruments with them and reasonably accurate watches. But under these conditions they could not hope to relocate the vessel. They did not expect to see the "Fram" again until they all reached Norway. Nansen himself did not believe that any land lay between him and the Pole. When he turned back from the Pole he planned to reach Spitsbergen. These were the conditions he expected and accepted.

Nansen and Johansen each had a sled with a carefully selected dog-team. On each sled there was tied a light Eskimo *kayak.* In the *kayak* their goods and equipment were packed. When they were on ice they traveled by sled; when they reached open water on their return journey, they planned to travel by *kayak*.

This plan they carried out but the going on the pack was very rough. Often the dogs were unable to move the sleds over pressure ridges and the men, always marching on foot themselves, had to assist the dogs with the heavy loads. They went forward until April 8th when they had reached 86° 14′ N. This was then the longest northward journey and the highest latitude ever attained by man. They had gone as far as reason and safety permitted, perhaps farther. They turned back, making for Franz Josef Land. Their supplies began to run out, their methods of navigation were uncertain, food supplies dwindled rapidly. For a few days Nansen suffered so severely with lumbago that he was scarcely able to move. But he recovered and they plunged on. They shot seal and bear for food supplies.

Then there was a period when no animals at all were seen and they had to grope their way over ice in a half-starved condition. They reached open water and took to the *kayaks,* lashing them together, putting the sledges aboard and proceeding by sail and paddle. They were attacked by a whole school of walruses and barely escaped. At the edge of an open lead a polar bear sneaked up on Johansen and knocked him down. Nansen just succeeded in freeing his gun and killing the animal to save his companion. Once a lashing broke, the canoes drifted away before the wind and Nansen had to plunge into the water amid the ice and swim to recover them. Finally they reached some small islands which they were unable to identify. On a larger island they passed the whole winter in a shack partly hollowed out of the ground and partly built up of stone. They lived on bear meat. In the spring as they were walking along this island they fell in with Frederick Jackson, of the Jackson-Harmsworth expedition. They were then still well and still traveling, but their hair was so long, their clothes so worn and caked with grease and dirt, their faces so tanned by exposure and grimy with the smoke of blubber fires that they were hardly recognizable.

Jackson had brought with him dispatches from the Norwegian government and letters from Nansen's wife. This was the first news they had had for two years. Jackson did not know what had happened to the "Fram." He thought from Nansen's silence that perhaps the "Fram" had been lost and Nansen and Johansen were the only survivors. Jackson, out of courtesy, did not dare discuss the matter for some time. Jackson's ship, the "Windward," arrived, and they all returned to Vardö (northern Norway) in August. There was great rejoicing which was made complete a few days later when the "Fram" arrived at Tromsö, where Nansen and Johansen joined the ship and the whole party was happily united.

After Nansen had left the ship, the "Fram" had taken a decided northward course and had reached 85° 57′ N. She had then continued the course Nansen had predicted for her and Sverdrup had succeeded in freeing her from the ice just north of Spitsbergen.

Nansen was more than a great explorer. How much more we have still perhaps to realize. He went on to a distinguished career in science, making great contributions to knowledge of the Arctic Sea and to oceanography generally. He maintained also an interest in zoölogy and in anthropology. He became a great and important statesman in a time of world crisis, beginning under the League of Nations a kind of disinterested and humanitarian service that must be its backbone if it is to succeed as a permanent international agency. Nansen's bold challenge awoke the world to action in the matter of Russian relief. His successful administration of that relief service and the development of the Nansen passport mark his services as one of the important civilizing influences in a time of apathy and chaos.

Nansen's career demonstrates, if any demonstration is necessary, that the explorer is more than a man with courage, strong muscles and an intense but limited objective in life. Indeed he showed how closely akin is the courage that leads to the discovery of the natural world and that equally great courage which is able to face problems of the social world. In his own person Nansen harmonized the interests of physical adventure, scientific inquiry, and broad humanitarian purposes. He brought to political problems the same daring, the same simple honesty, the same sense of sportsmanship that made him great as an explorer.

ROALD AMUNDSEN (1872-1928)—THE NORTHWEST PASSAGE

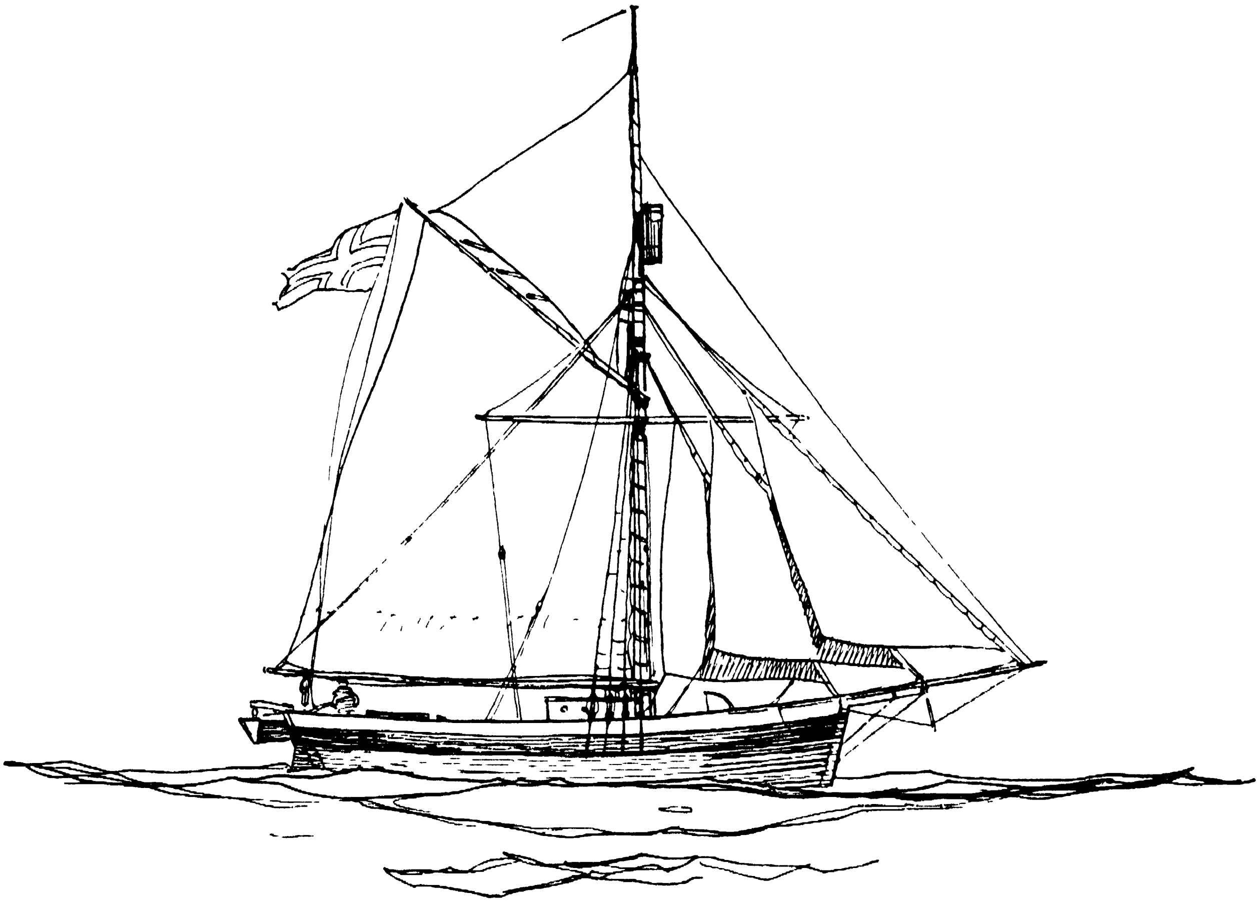
"... I had been struck by one fatal weakness common to many of the preceding Arctic expeditions. This was that the commanders of these expeditions had not always been ships' captains. They had almost invariably relied for the navigation of their vessels upon the services of experienced skippers. The fatal defect of this practice had been in every case that, once embarked at sea, the expedition had not one leader but two. . . . I was resolved, therefore, that I should never lead an expedition until I was prepared to remedy this defect. The only way to remedy it was to equip myself with experience as a skipper and actually to qualify as a ship's captain."

AMUNDSEN arrived at this decision when he was 20 years old. He had then made up his mind that he was to be an explorer at any cost and with characteristic thoroughness he signed on as a common sailor aboard a sailing ship in order that he might acquire the experience that would eventually give him a skipper's license. This was something of a transition for a young man who had come of a good family from a district near Oslo, who had had every opportunity for a more formal type of preparation for life and who had in fact spent two years in the medical course at the university. But to Amundsen being a hand before the mast seemed a natural part of the career on which he had been determined ever since, as a young boy, he had read the accounts of Sir John Franklin's early explorations.

In 1897 Amundsen found his first opportunity to participate in active exploration. In this year a Belgian Antarctic expedition was being organized. Ernest Solvay and others were providing the funds. The expedition was under the leadership of Adrien de Gerlache and a company of international scientists was participating. Amundsen was glad of the opportunity to sign on as first-mate.

The expedition proceeded auspiciously to South America and spent some weeks along the shores of Tierra del Fuego. This region was then very little known scientifically and it yielded to the different scientists aboard a rich harvest of specimens. Further work was carried out at Graham's Land. Then the ship suddenly was caught in the ice and unable to free herself. The ice-field closed in about them and held them like a vise. Unable to move in any direction, they were compelled to be the first vessel to go through the Antarctic winter. They were unprepared for such an ordeal and spent the winter in the greatest misery. With no proper provision for lighting and heating the vessel for so long a period and oppressed by their loneliness and by the endless noises of the ice-pack, the whole party sank into a state of mental depression. Two of the sailors went insane and every member of the ship's crew suffered more or less from scurvy. Finally the commander of the expedition and the captain had to seek their beds. Amundsen was left in charge.

The company had been living on ship's stores



THE "GJÖA"

THE handsome little sloop in this drawing is the "Gjöa." In this vessel Amundsen sailed from Christiania (Oslo) in June, 1903. He went to Greenland and then made the first successful sailing trip through the Northwest Passage, coming out through Bering Strait and reaching Nome, Alaska, in 1906. The "Gjöa" was thirty years old when Amundsen bought her and began to work with her. She had been built as a herring boat at Hardanger in 1872. She was a ship of 70 tons, only 69 ft. in length over all, with a 20.66 ft. beam, and 7.5 ft. draft. She proved a wonderful vessel for this hazardous trip.

She was sturdy, capacious and easy to handle. There were seven men in Amundsen's group and in the main hold of this little ship they stowed away food and equipment enough for five years. She was equipped with a small petroleum engine of 13 horse-power of whose effectiveness Amundsen spoke very highly. She carried for this motor 2,200 gallons of petroleum.

In the midst of the Arctic waters north of America, the engine-room once caught fire and the whole of the fuel supply threatened to explode. Foresight in planning proper fire equipment and prompt action are all that saved the vessel. On another occasion the "Gjöa" was caught in a great storm on unexpected rocky reefs. She was badly pounded and bumped bodily over one reef. Her sturdy and honest build survived even this experience.

Note the great amount of sail this little ship can carry and also the handiness that is achieved by breaking the sail area up into small parts. A sketch published by Amundsen shows her at the time she had negotiated the passage and met the American whaler "Charles Hansson." She has all sails set and is carrying mainsail, main-topsail, squaresail, square topsail as well as the three head-sails.

The "Gjöa" was sailed to San Francisco where she was presented to the city and is preserved in Golden Gate Park.

and Amundsen wisely concluded that a diet of fresh meat would do a good deal to relieve their illness. From a snow-bank near the ship he dug out the carcasses of frozen seals and prepared seal steak for the company. The change of diet made a wonderful change in the health and spirits of the men.

Amundsen did what he could to improve their situation but he says that during this trying period the chief source of strength of the expedition was the ship's doctor, a strange and energetic little man from Brooklyn, New York, who had once made a trip to Greenland with Peary. Dr. Cook did everything that could be done to aid the company and improve the situation of the ship. He was cheerful and courageous and looked after the other members of the party. He organized and led the scouting expeditions that went across the ice to see what the prospects were for releasing the ship; he organized the party that drilled holes in the ice and planted charges of dynamite leading in a straight line from the bow of the vessel to the lead. When these discharges exploded nothing happened, but later when the ice-pack weakened, it was along this line that a crack opened and through this channel that the ship was finally released. According to Amundsen's account Dr. Cook was unfailingly cheerful, honest and courageous. Yet this is the man who later claimed that he had ascended Mt. McKinley, when as a matter of fact he had only reached the summit of one of its lower spurs. He startled the world and won fame when he claimed he had reached the North Pole and for a brief moment had his claim accepted. This is the Cook who wound up in a Federal penitentiary for his part in a bogus financial scheme.

Amundsen wonders and we wonder too what happened to transform the Cook who participated in the Gerlache expedition into the Cook who stooped to such impostures.

After 13 months in the ice the vessel was finally freed and returned to Europe in 1899. Despite its hardship the vessel came back with useful scientific observations.

Amundsen the next year received his captain's license and turned at once to the organization of his first independent expedition. In this he had the advice and assistance of Dr. Nansen. Even with this help Amundsen went through a period of excitement, discouragement, difficulty and delay in raising the funds which he needed for his rather modest expedition. That is, the costs may be said to have been moderate whereas the plans that Amundsen laid out were on a rather ambitious scale. He intended nothing less than the completion of a voyage through the Northwest Passage and coupled with this a plan to reach and relocate the North Magnetic Pole. With this in mind he purchased and equipped the "Gjöa," a small but seaworthy example of a Norwegian fishing boat. Petroleum or gasoline motors were just beginning to be effective and Amundsen rather scandalized people by installing in his ship a small motor to serve as auxiliary. Later he reported that the motor served him well throughout the trip, though when there was a fire in the engine-room in the middle of the Arctic wastes the presence of the inflammable fuel aboard certainly represented a factor of the highest danger.

Amundsen sailed in June, 1903, with six companions. As a matter of fact, he was having some difficulties with a creditor and when the ship was practically equipped he and his men went aboard unannounced in the middle of the night and slipped out of the harbor in a deluge of rain.

They were off to the great adventure—the Northwest Passage!

The "Gjöa" made good progress to the west coast of Greenland, where she stopped at two harbors and picked up dogs and fuel for the motor. Then they proceeded westward and made a stop at Beechey Island, where they made observations for the direction of the Magnetic Pole. This seemed to lead them in the direction of the Boothia Peninsula and they proceeded through Peel Strait. Few soundings had been taken by the early navigators and the "Gjöa" had to make her way by a series of continuous soundings. They survived the engine-room fire and a terrific gale which threw them over some rocky reefs. Then, as winter was drawing on, they found a "beautiful little landlocked bay" on the south coast of King William Island. Here they wintered and built small observatories in which they set up modern and accurate instruments and from which they conducted a long series of observations regarding the North Magnetic Pole. Their series of observations kept them well into the next summer, and it was August 13, 1905, before they were able to start in earnest on the Northwest Passage. They did this by sailing through Simpson Strait. Most of the early attempts at the Northwest Passage had been made in higher latitudes opposite the north end of Boothia. Amundsen sought the route westward, directly opposite the southern end of King William Island. He followed the main coast closely and found open water, whereas the ships that had attempted the broader channels in the north were being continually blocked and beset in the ice.

They had to sound frequently, and the "Gjöa" made slow and erratic progress but, on August 26th, they sighted ahead of them the whaler, "Charles Hansson" of San Francisco. Amundsen was just congratulating himself upon the success of the trip and was working westward when unexpectedly ice closed in and on September 2nd they had to come to a stop off King Point. Here they prepared to face another winter. They were not far from the whaling vessels that were iced in at Herschel Island.

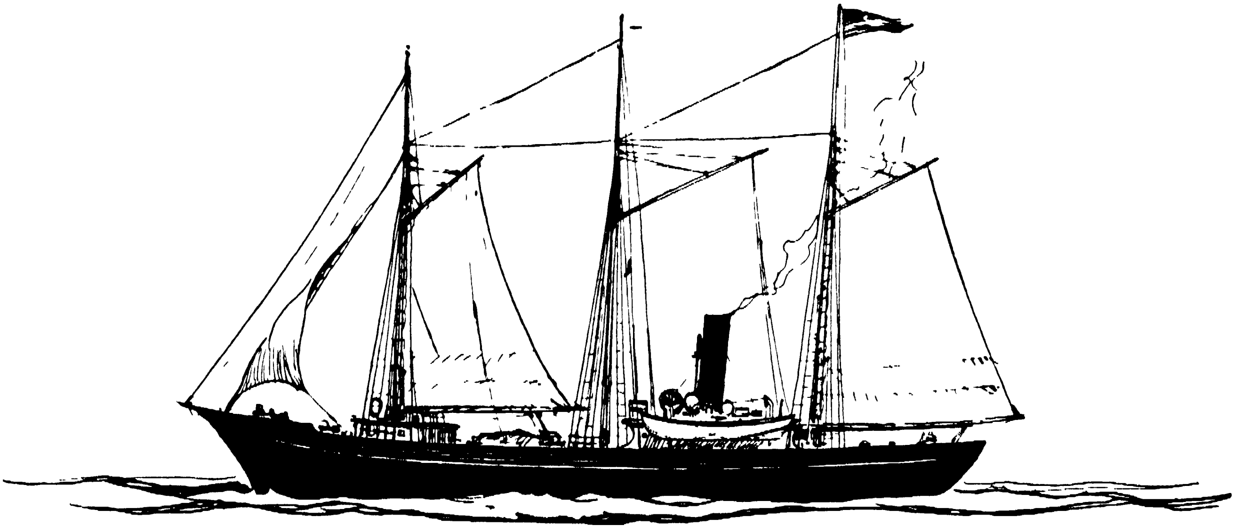
Amundsen saw his men comfortably set up here in winter quarters. Then, from King Point, in company with the captain of a whaler which was stranded, and an Eskimo guide and his wife, he made a long inland passage by sledge, crossing the mountains at an elevation of 9,000 feet and coming down in the valley of the Yukon. Later he arrived at Fort Egbert, the northernmost United States Army post. From here he was able to send telegrams regarding his success and the progress of his expedition. In February, 1906, he made his way back to Fort Yukon and from there proceeded to his ship. By July the ice broke up and the "Gjöa" was able to free herself and proceeded easily through Bering Strait and down the coast to California, where she arrived in October.

Amundsen had carried out successfully a plan that had been the ambition of his life and that before his day had been the goal of navigators for a period of over 400 years. In this search scores of vessels had been wrecked and hundreds of men had lost their lives. When Amundsen at last achieved the passage it had no commercial value and even a waning scientific interest, but it was a skillful piece of navigation, well planned and well carried out. Its greatest scientific value was the relocation of the Magnetic Pole and the very extensive series of magnetic observations connected with this work.

Amundsen's next plan was an attack on the geographic North Pole but by a strange twist of fortune he found himself instead at the South Pole!

ADMIRAL ROBERT E. PEARY (1856-1920)

IN 1891, while Nansen was perfecting his plans for the voyage of the "Fram," a young civil engineer in the American navy, Robert E. Peary, was conducting his first Polar exploration. He had a small vessel named the "Kite" which he was



THE "ROOSEVELT"

THE "Roosevelt" was a heavy built three-masted auxiliary schooner. She was especially designed and equipped for Arctic exploration. She was named after President Theodore Roosevelt who was interested in Peary's ambitions.

The vessel was commanded by Captain Bob Bartlett who was, and still is, one of the best Arctic navigators and ice-seamen in the world. Certainly a part of Peary's success was due to Bartlett's great skill in bringing the "Roosevelt" safely to Grant Land, and in freezing her in off Cape Sheridan for the winter.

Bartlett helped Peary in planning the "Roosevelt" for this kind of rough-and-tumble work. Like all ships designed for use in the ice she was round and easy in the bilges and shallow in draft so that when the ice squeezed her she might be raised up rather than crushed. She was strengthened inside with special transverse diagonal timbers to relieve the pressure on her skin. She was so contrived that her rudder could be drawn up out of the ice and repairs made to both rudder and propeller. In addition to her fore-and-aft schooner rig, she carried on the foremast a square sail. She was a knock-about, that is to say she carried virtually no bowsprit so that her head-sails were inboard and could be easily reefed and furled from the deck.

taking for the exploration of northern Greenland and Grant Land. The first important advance in this route had been made by E. K. Kane in 1853-1855. Kane took his ship, the "Advance," to 78° 37′ N. and his sledge-parties reached Cape Fraser in Ellesmere Land and Cape Constitution in Greenland. He investigated Smith Sound and the Kane Basin. The voyage was financed by Henry Grinnell and George Peabody and was one of the expeditions sent out to seek information regarding the fate of Sir John Franklin. Kane was followed in 1870-1873 by C. F. Hall who took his ship, the "Polaris," to 82° 26′ N.

Hall died during this trip while on an exploration in Greenland, but his party discovered a route which led apparently to the Arctic Sea. The "Polaris" was caught in the ice and the party aboard ship was alarmed by the terrific noises of the ice growling and shrieking about them. Many of them thought the vessel was about to be crushed. They made a camp on a large ice-floe beside the ship. In a sudden change of the direction of pressure the floe was swept away from the ship and throughout an Arctic winter the party drifted southward with the pack. The floe traveled for 1,300 miles with the party aboard before it finally stranded on the Greenland shore.

Remarkable as it may seem, all the members of the party survived this experience. In the middle of their extraordinary journey an Eskimo woman gave birth to a baby and it also reached Greenland in safety. The "Polaris" drifted to Greenland and the party which had remained aboard was rescued.

General A. W. Greely in 1881-1883 had added important information about the western side of the passage from a base in Grant Land (northern Ellesmere Land). Peary was trying to develop a further knowledge of this passage and these lands as a definite route for a Polar expedition. He was also much interested in the question of where Greenland ended. At this time it still seemed possible that Greenland might prove to be a continent extending almost indefinitely toward the Pole.

At the very start of his Arctic work, Peary met with a serious accident, one which might well have terminated his expedition if not his career. It served instead merely to reveal his extraordinary resolution and his capacity for overcoming difficulties. He was at the wheel of the "Kite" when a large chunk of ice suddenly jammed the rudder. The wheel kicked out of Peary's hands and began to reverse itself. His leg was jammed and before he could free himself both bones in the lower leg were broken. It was proposed at once that the expedition return with Peary. To this he would not assent. He felt that he owed it to the backers of the expedition to continue. While the ship went on the leg was set and Mrs. Peary, who was aboard, nursed him back to health and strength. By Christmas time he was strong enough to join in a snow-shoe race with the Eskimos and the other members of his party—and to win the race. On July 4, 1892, he discovered Independence Bay. He established the fact that Greenland was an island.

He also arrived at two decisions that were of great help to him in the subsequent development of his plans. He was sure that Grant Land and Greenland, thrusting as they do so far toward the Pole and presenting such a length of Arctic coast, gave him the best possible point of departure for a dash for the Pole. He also learned much about the local Eskimos' methods of travel and of life and reached the conclusion that these methods were best adapted to Arctic travel and that the Eskimos themselves, under the direction of a white man who understood them, constituted the best possible personnel for the rank and file of an Arctic expedition.

The years between 1898-1902 Peary spent in the North in the same general region, developing his plans and his methods of travel. In 1902 he made a short passage northward from Grant Land, arriving within 343 geographic miles of the Pole. By 1906 a group of American citizens, which included Morris K. Jesup, Thomas H. Hubbard, Herbert L. Bridgeman and Anton A. Raven, had organized a Peary Arctic Club and had provided for Peary's proposed expedition a new vessel named the "Roosevelt," especially built and equipped to meet the leader's needs. In 1906 the "Roosevelt" went north on her first trip and Peary on a sledge-journey reached 87° 6′ N. This season a succession of heavy gales had split the ice and left large leads of open water. These occasioned delay and finally turned Peary back but not before he had broken Cagni's record of 1901.

Encouraged by this partial success Peary and his supporters devoted the winter to planning a new expedition for the next summer. In the death of Morris K. Jesup, Peary lost one of his most ardent supporters. But Mrs. Jesup made a liberal contribution to the next season's work. The "Roosevelt" had to undergo some repairs and had to be equipped with a new set of boilers for the new task. The resulting delays were extremely irksome to Peary who felt that the years were drawing on and that every year now counted against his chances of success.

The "Roosevelt" sailed in 1908 under command of Robert A. Bartlett (Captain "Bob") with all the American members of the expedition aboard as well as extensive supplies for the Arctic campaign. The ships stopped in Smith Sound to take on dogs, sledges and a large, carefully selected group of Smith Sound Eskimos.

Captain Bartlett's unusual ability as an ice navigator brought the "Roosevelt" successfully to her winter berth off Cape Sheridan on Grant Land where she was frozen in the ice. Supplies were landed here and in the autumn a succession of sledge-journeys transported them to the depot at Cape Columbia which was to be Peary's point of departure for the Polar journey in the spring. This transport problem and a series of hunting expeditions to bring in musk-ox, caribou and other game as a source of fresh meat supplies for the winter kept all hands busy. The winter passed rapidly and successfully and spring found all in good health.

The Polar dash in the spring was a stirring performance, not so much because it involved danger, disaster or sudden emergency but rather because it proceeded so regularly according to the schedule that Peary had evolved. The party left Cape Sheridan for Cape Columbia in relays between February 15th and February 22nd and, according to schedule, the start of the Polar trip was made on March 1st. The following schedule shows the regularity of the progress to the Pole.

84° North on March 8th
86° " " " 23rd
88° " " April 2nd
89° " " " 4th

The Pole was reached at 10 A.M. on April 6, 1909.

Peary spent 30 hours at the Pole making observations, taking photographs, attempting to make soundings through the ice and examining the surrounding ice-field. An igloo-camp was built and he and his party attempted to get some rest but they were too elated to do much sleeping. This is hardly surprising even in so steady and unemotional a man as Peary who had for years been training himself to keep free from excitement and to devote every effort to surmounting difficulties. But his hours at the Pole represented the culmination of over a quarter-century of persistent effort to one final end. He was then 53 years old and had just completed one of the longest and speediest journeys ever made over the Arctic ice. He himself believed that he had reached the goal just in time.

He started south again on April 7th, traveling rapidly and picking up the various supply-depots that had been established on the northern passage. Only at one point did he diverge from his northern route and this was soon corrected. He reached Cape Columbia on April 23rd, with all members of his little Polar party completely exhausted but uninjured and well. The journey north occupied 37 days, of which 10 days had been occupied in resting or in waiting to establish the various depots. The return journey over already broken trail was made in 16 days.

Peary attributed his final success, first, to the use of Cape Columbia as the northernmost possible base; second, to the use of sledges, dogs and Eskimos as providing the most tried and most effective method of Arctic travel; third, to the fact that he set out from Cape Columbia on a course to the west of north, thus making allowance for the persistent eastward drift of the ice-pack; fourth, to the careful selection of his personnel and to the splendid service they rendered in supporting his advance.

To these factors should be added Peary's own great capacity for careful and systematic organization. He developed with great care and precision a plan and theory regarding the activities of his supporting parties. He started from Cape Columbia with a number of teams in command of the men who assisted him: Goodsell, George Borup, Ross G. Marvin, and Captain Bartlett. These teams went out heavily equipped, each in turn establishing a station and then turning back. At each stage the less experienced or the most fatigued of the men were sent back. Captain Bartlett, who led the fourth and last of the supporting parties, turned back at 87° 47′ N. He gave Peary magnificent support, not only on the ship but on the trail as well. From here Peary went on with his Negro assistant, Matthew A. Henson, and with a selected group of four Eskimos. Henson had been with Peary for a great many years and his strong physique and unusual skill as a sledge driver recommended him for the final dash. Henson, who has always borne his honors with dignity and modesty, is living quietly in New York City. I believe that most of the Eskimos who accompanied Peary have died and that Henson is probably the only living man who has actually set foot on the North Pole.

Another factor that contributed in a measure to Peary's success was reasonably satisfactory weather and good conditions in the ice. The great open "lead" in the ice that Peary had previously encountered caused some delay and worry but was not an insuperable obstacle. As they were nearing Cape Columbia, Ootah summed it up by saying to Peary, "The Devil is asleep or having trouble with his wife."

The whole expedition was marred by only one tragedy. Dr. Marvin, who led one of the supporting parties, never arrived back at Cape Columbia. It was thought for a while that he had drowned while crossing one of the leads. After years had gone by it was discovered that on the return trip his Eskimos had disagreed with him as to the route of travel and he had been murdered. But this was the only cloud on the happiness of the expedition as it sailed southward on the "Roosevelt," carrying with it the first man to reach a geographic Pole, bearing him back from a long-delayed triumph to a well-deserved fame.

VILHJALMUR STEFANSSON (1879-   )

AFTER Peary's successful dash to the North Pole there was a natural pause in Arctic work and a corresponding increase of interest in the Antarctic, as can be seen clearly in the sequence of stories about this region.

But during these years of interest in the Antarctic, the Arctic region was not deserted. It was during 1913 to 1918 that Vilhjalmur Stefansson led a five-year expedition into the western sector of the American Arctic. Owing partly to the fact that Stefansson returned during the World War and partly to the fact that his expedition had a broad purpose rather than a sharply fixed goal, his work is perhaps not as widely known as it deserves to be.

Stefansson, who had conducted two previous expeditions in the Arctic, intended to organize the expedition as an American enterprise. It was planned originally that it should be conducted under the auspices of the National Geographic Society, the American Museum of Natural History and the Philadelphia Academy of Sciences, but there was a delay in raising some of the necessary funds. Stefansson was anxious to be off and he learned through friends in Canada that there he could find an assured source of financial support. The upshot of this was that, after negotiations, the Canadian government took over Dr. Stefansson and the plan of the whole expedition exactly as it had been formulated by the American scientists.

The party was a very large one, the American and Canadian personnel running to some thirteen picked scientists and sixty-eight men, including only part of the Eskimos. Among those associated with Dr. Stefansson on this enterprise were George H. Wilkins (now Sir Hubert Wilkins), who had come recently from Australia and who had served as photographer; Captain "Bob" Bartlett in charge as captain of the chief of the three vessels of the expedition; Diamond Jenness, Canadian government anthropologist; and Dr. R. M. Anderson.

Stefansson's party split into several divisions to carry out several aspects of the work. One section of the expedition was aboard the ship "Karluk" when it was caught in the ice. It was crushed and sunk. A number of the men were lost, but a division of survivors made their way across to Wrangel Island. From the island Captain Bartlett with an Eskimo made a rapid and difficult journey to the Siberian coast to report the disaster and organize a rescue party. He crossed in a whaling ship from Siberia to Alaska where a number of vessels were sent to the relief of the Wrangel Island party. The story of the disaster and the rescue of the survivors are among the most detailed and interesting accounts of modern exploration.

But despite the disaster and apart from its dramatic side, Stefansson's expedition was one of great importance. He was in fact working in the Arctic islands beyond those points that had been reached by McClintock, McClure, Franklin and others. He worked in new regions farther west and farther north than the territories to which they had devoted attention; and even where their surveys overlapped, Stefansson had an opportunity for more careful observation. In addition to the work of travel and topography, Stefansson added important information of an anthropological character. He was himself trained as an anthropologist and he had Jenness working with him. The expedition also conducted studies in geology and oceanography. It is estimated that his total surveys covered over 100,000 square miles of sea and land, filled in many unknown coast lines, made a number of original discoveries, including three large and several small islands. In the course of his expedition he attained a latitude of about 81°.

It was Stefansson's belief that there was no lack of animal life even in the midst of the Arctic seas and that a white man with realistic understanding of the distribution of the animal life in the Arctic could sustain life even in regions shunned by the Eskimo. His own northern advance with small parties tested this belief in practice and his success in passing five consecutive winters in high latitudes goes a considerable way to substantiate his claims. Most interesting and well-organized accounts of his work during this period are in his book, *The Friendly Arctic*.

THE POLE BY AIR

SALOMON AUGUST ANDRÉE (1854-1897)

ARCTIC aviation began in 1896 when S. A. Andrée, who had done some Polar work in 1882 and who also had experience as a balloonist, took a balloon to Danes Island, Spitsbergen. His balloon this year was a poor one, and the weather conditions were against him, so he could not count on a northward drift. But a year later he made another start. This time he had with him as fellow-voyagers Nils Strindberg and Knut Fraenkel. He made his ascent on July 11, 1897, in the "Eagle." As he progressed he dropped messages in buoys and several of these were found. Andrée sailed away into the unknown; he never returned and not even the wreckage of his ship was reported.

On August 6, 1930, thirty-three years later, a party of sealers, connected with a Norwegian expedition on its way to Franz Josef Land, went ashore on the southwestern point of White Island and there discovered the remains of the Andrée expedition. The journals and diaries of the expedition were recovered and showed how the flight was made for three days to 83° N. and how almost three months were spent in sledge travel over the ice to bring the exhausted and injured men to White Island where they finally died. Even photographs were recovered from their cameras, and these were painstakingly developed by a special process. Considering their great age and rough treatment the pictures are wonderfully clear and give a dramatic record of this extraordinary, early attempt at exploration by air.

Walter Wellman, an American, made the next attempt to travel in the Arctic by air, also taking his balloon to the Spitsbergen area. Wellman had already tried some expeditions in this region. He was later to make an unsuccessful attempt to cross the Atlantic Ocean in an airship driven in a more or less helpless condition many miles to sea before he and his party were providentially rescued by passing steamers. His attempt at Spitsbergen in a balloon was not a success.

A balloon ascension by Armitage, who was a member of Scott's first expedition, introduced aviation in the Antarctic. While no disaster occurred, it was not a great success. The start was made from a portion of Ross Sea, which for a while received the name Balloon Bight.

The War and the lack of success in previous ventures arrested the use of air machines of any kind in Polar exploration. However, at the close of the War, while general aviation was undergoing a rapid expansion, the use of the airplane in Arctic exploration began to receive serious attention.

In July, 1923, a German expedition made flights over Spitsbergen in an airplane. They carried out some interesting photographic work and traveled from point to point in the Spitsbergen group of islands, but they did not venture across the Arctic ice.

An Oxford University expedition in 1924 used an airplane piloted by George Binney. The machine was not in very good mechanical condition or well-adapted for its task. Though Binney flew with it a number of times he was in continual difficulty with it because of motor failure and other causes.

In the meantime, aerial photography and aerial mapping had developed rapidly as practical measures. Planes were being used for survey and exploration in many parts of the world.

AMUNDSEN AND LINCOLN ELLSWORTH (1880-)

ABOUT this time Amundsen was in San Francisco, in debt and discouraged by his lack of success in the expedition which he had undertaken in the "Maud." Amundsen reviewed the plans and hopes he had long entertained of exploring the Arctic Sea by air. The possibility of doing this had first occurred to him when he had received word of Peary's having arrived at the Pole but at that time the attainment of the South Pole seemed to him of primary importance. The rapid improvement that was taking place in airplanes and in air travel revived all his hopes in the practicability of exploration by air.

On his return to New York from a lecture tour his depression was at its peak, when suddenly, while in his room at the Waldorf-Astoria, he received a telephone call from Lincoln Ellsworth who offered to supply funds for an expedition by airplane.

Amundsen and Ellsworth, once their understanding was arrived at, worked rapidly. They acquired two Dornier-Wal flying boats from Germany and had them delivered in Spitsbergen and they were there themselves ready for the flight in May of 1925. In one ship there were Ellsworth as navigator, Dietrichson as pilot, and Omdal as mechanician; in the other, Amundsen as navigator, Riiser-Larsen as pilot, and Feucht as mechanician. It was computed that each ship carried enough gas for a journey of 600 miles and return.

On May 21st the ships took off from Kings Bay, Spitsbergen, and proceeded, as planned, toward the Pole to 87° 44′ N. Here engine trouble with one of the ships caused them to descend onto an empty lead. The party was then approximately at the limit of their cruising radius, that is 600 miles. They were on open water that was likely to freeze at any moment. One of the ships was more or less disabled and they had provisions for only three weeks for the whole party. Their sole opportunity of rescue lay in their ability to get one of the ships into the air again.

To add to their difficulties the lead rapidly iced over, injured one of the boats and further cut down their chance of escape. They worked feverishly for many days, trying to get one of the ships in repair and to find a method of launching it from snow or ice, a thing which the ship was not designed to do. Finally, by June 15, they had at great pains built up a runway on the ice which they calculated to be of sufficient length for a start. At least it was the best they could do and they had to face it. All of the gasoline was transferred to one machine, the "N-25," and all the party also, so that there were six men crowded into the cockpit as well as such provisions and equipment as they could salvage. Fortunately, with the motor going full-blast, they began to gather headway and slid across the runway. They lifted just in time and headed in the direction in which they believed Spitsbergen to lie. They were down to their last half-hour's supply of gasoline when they suddenly saw the familiar peaks of Spitsbergen in the distance. Their motor held up and they were able to glide to a landing in open water along the shore.

The same year that Amundsen and Ellsworth were engaged on this memorable flight Commander (now Rear Admiral) R. E. Byrd was testing his wings in a series of short flights with MacMillan in an expedition to Greenland.

In 1925, while at Spitsbergen, Riiser-Larsen had suggested to Amundsen and Ellsworth that a dirigible would prove a more satisfactory instrument for a trans-polar flight from one continent to another. With this Amundsen and Ellsworth concurred; it seemed to them that the dirigible was more capable of sustained flight and also of maneuverability to permit longer observation of any important discovery in their path. But dirigibles were not easy to find. Then Riiser-Larsen said that he had heard that an Italian ship, the "N-1," was available for purchase. After some involved and formal negotiations the "N-1" was purchased from the Italian government and re-named the "Norge." Mussolini himself signed the sales contract. Umberto Nobile, who had supervised the construction of the machine, was signed on as pilot of the airship.

The expedition had been planned by Amundsen and Ellsworth as a joint Norwegian-American undertaking, but by the time the trip was over Nobile had elected himself to the position of joint commander at least.

After completion of arrangements in Italy, Amundsen and Ellsworth returned to Norway to make further arrangements for the Polar voyage and particularly to contrive a hangar for the machines at Spitsbergen. Nobile flew the "Norge" across Europe to Norway and then to Spitsbergen.

ADMIRAL RICHARD EVELYN BYRD (1888-)

A FEW days before the "Norge" arrived at Spitsbergen a freighter came poking her way into the harbor and tried to draw up at the Danish government dock. The ship was the "Chantier." She carried Byrd and two airplanes, with the larger of which Byrd meant to try to reach the Pole. A government boat was occupying the pier and the "Chantier" could not tie up as she had planned. There was a stiff wind blowing and some floating ice in the harbor. None the less Byrd, with great ingenuity and enterprise, contrived to land his large, tri-motor Fokker, the "Josephine Ford." He did this by making a kind of floating platform of the "Chantier's" small boats and testing this platform by rafting the smaller of his two airplanes ashore. Then he succeeded in swinging the large fuselage and central wing section of the "Josephine Ford" from his ship to the raft and in getting it from the raft to the shore without serious injury. For some days the little town and harbor of Kings Bay were full of excitement as both the dirigible and the airplane were equipped and tested for their flight.

Byrd and Floyd Bennett were first off with their heavily laden ship. The run available to them for a take-off was limited and they had already had difficulty with a broken ski. Finally, however, the ship took off on May 10, 1926, circled the harbor and mountains of Spitsbergen and headed for the Pole! The flight itself was made on a straight course and without difficulty. The ship circled the Pole and was back in Spitsbergen a little less than 16 hours after the start and was received with great enthusiasm. No new land was sighted in the Arctic seas and no new features observed.

AMUNDSEN AND ELLSWORTH IN THE "NORGE"

THE next day the "Norge" pulled out of her shed and set off on her long voyage. Aside from Amundsen and Ellsworth the complement of the "Norge" and their duties were as follows: Nobile at the controls; Riiser-Larsen, navigator; Oscar Wisting, who had been with Amundsen to the South Pole, was in charge of one of the rudders, with Lieutenant Horgen in charge of the other; Birger Gottwaldt in charge of the radio; weather in charge of Professor Finn Malmgren; Frederick Ramm, journalist; and Storm-Johnsen as radio telegrapher. These men traveled in the main gondola, while crews of mechanics were in the tiny gondolas carrying the motors. The Pole was passed and after forty-two hours the coast of Alaska was sighted at Point Barrow and a short while later the "Norge" came to ground at Teller, Alaska. She had then accomplished her purpose, having passed across the Pole and the Polar Sea from Spitsbergen to Alaska. She had traveled in all 3,391 miles, a distance farther than the direct route from New

York to San Diego. A great portion of this route was over unexplored Polar Sea. Amundsen attributed a considerable part of the success of the trip to Riiser-Larsen's excellent navigation.

Nobile, both during the flight and afterwards, no doubt behaved in a fashion that gave Amundsen justifiable cause for irritation. But it was unfortunate that a certain amount of bickering detracted from the enthusiasm with which the performance was received and was quite inconsistent with the dignity and importance of the flight that had been made.

GENERAL UMBERTO NOBILE (1885-)

AFTER his flight in the "Norge," Nobile had no difficulty in equipping an expedition of his own for a Polar flight. The necessary funds were provided by the city of Milan, and the expedition received the endorsement of the Royal Geographical Society. The work of fitting the "Italia," a dirigible with an envelope capacity of 19,000 cubic meters, for Polar work went on at great pace at Rome and two years from the day on which the "Norge" had landed at Teller in Alaska his expedition was in readiness to go. From the very start the "Italia" seemed ill-fated, for in her flight from Italy she encountered a thunderstorm and later inclement weather delayed them, so that it was not until May 15, 1928, that they actually got under way. Then it was their intention to make a thorough exploration of Nicholas II Land, but the weather became worse, and the "Italia" had to return to Kings Bay. On May 20th they made another start, this time for the Pole, and on May 24th, at one o'clock in the morning, reached their destination. The "Italia" then flew about over the Pole for some two hours, and, although the plan had been to make oceanographical observations, particularly to sound the sea and take samples of water at various depths, the dirigible was headed once more for Kings Bay.

At first they made good headway and then a strong wind from the northwest, together with the accompanying fog, falling temperatures, and violent winds, caused them to reduce their speed. Meantime ice had formed on the wireless antennæ and put the radio out of commission. As they went on the fog grew thicker and snow and ice accumulated rapidly, so that they had only their instruments to steer by. Panic ensued, the crew disregarded the orders of the commander, and the ship crashed! In the crash the cabin became detached, but the dirigible rose rapidly, helplessly out of control, and the last sight of it was a streak of black disappearing in the distance.

Meanwhile the men who had been in the cabin at the time of the crash were too stunned to act. Nobile had a broken arm and leg, another had sustained a compound fracture of a leg, and one was dead.

Fortunately the emergency wireless set was found to be intact and was set up in camp. With this apparatus the wireless operator, Biagi, was able to send messages which were picked up at sea and relayed to shore stations. Owing to the fact that he was uninformed about the wave lengths and calls of the rescuing ships he was unable to direct them.

Elaborate preparations were made to rescue the "Italia" party. A plane was sent by Norway and plans were soon under way for collaboration in relief between Norway and Sweden. The Italian government chartered the "Braganza," which together with the "City of Milan" was to assist in a rescue. It also organized an aerial expedition to make a systematic investigation of the territory where the "Italia" was last heard from. At Moscow there was a project on foot for sending an ice-breaker.

On June 5th a Russian farmer near Archangel picked up the words "Italia" and "Nobile" in an S O S call, as did vessels at sea. Other disconnected messages followed and it was finally on June 8th that the "City of Milan" established communication with the survivors. Keen competition followed among the various countries to make the rescue.

Finally, a Russian aviator, Tschuchnovski, working in conjunction with the ice-breaker "Krassin," located Mariano and Zappi 40 days after they had left the main party, together with Malmgren who had died, in an effort to reach land and direct rescuers to the main party. Although efforts had been continued to rescue the Nobile group, it was not until June 20th that Major Maddalena in the hydroplane that he had flown from Italy finally sighted them. He was unable to land but he threw down to them the supplies that they most needed and the next day two Swedish Hansas flew over them and dropped other supplies.

Finally Captain Lundborg in a Swedish plane succeeded in reaching the floes where the Nobile survivors were encamped. There was place for only one man in the rescuing ship and Nobile himself occupied this place, leaving behind him in the camp one man with a broken leg. It was later explained that the General had first intended to remain himself at the camp but changed his mind when Lundborg suggested that he would be better able to organize and direct relief from some point ashore. But the incident continued to leave an unfavorable impression.

One of the most unfortunate outcomes of the Nobile disaster, however, was that Amundsen was lost in the rescue operations. He secured a plane as soon as possible and started to the rescue with full vigor. The plane in which he was traveling took off from Norway on the way to Spitsbergen but never arrived there. It was sometime before it was fully realized that Amundsen was unreported and probably in danger, for attention was still directed to the Nobile rescue. Then planes were sent in search of Amundsen but no trace of him was found. Finally, wreckage of the ship was discovered which left no doubt as to his fate. Amundsen had often said that he hoped to die in action while engaged in a worthy undertaking, and our consolation for his loss must be that his final wish was fulfilled. Norway gave to the world in the same generation Nansen and Amundsen, two of the greatest Polar explorers of all time.

The Amundsen story is scattered over many parts of the world. He had to his credit the first voyage by ship through the Northwest Passage; he had discovered the South Pole, had been the first to fly nearly to the North Pole, had located the North Magnetic Pole and had repeated the Northeast Passage.

Duke of the Abruzzi (1873-1933)

THE fact that the Italian nation has not often participated in distant voyages of exploration makes the unfortunate effect of General Nobile's conduct doubly unfortunate. Readers who feel some distaste for General Nobile's personality and performance are asked to restore their judgment of Italian explorers by remembering the solid and unusual services to exploration performed by the Duke of the Abruzzi and by recalling his modesty, his courtesy and his workman-like methods. As a young man he was a bold and effective mountaineer. Then in 1901 he led a successful expedition to Franz Josef Land. He was himself incapacitated for sledge work on this trip but his assistant, Captain U. Cagni, made a bold dash from the north of Franz Josef Land over the Arctic ice and reached 86° 34′ N. latitude, advancing a little farther than Nansen had done and thus setting a "farthest north."

In 1906 Abruzzi climbed the Ruwenzori Mountains ("the Mountains of the Moon") in Africa and brought back excellent maps of the mountain region. He crowned his work in 1909 by a remarkable series of climbs and investigations in the Karakoram or the Western Himalaya Mountains. On this expedition he set an altitude record for climbers on Bride Peak. He returned with a remarkable series of mountain photographs. This expedition also put into use a photographic method of mapping which had recently been developed in Italy. It was one of the forerunners of some of the photographic methods of survey and mapping which have found such wide application in connection with airplane surveys.

A Note on Mountain Explorers

THERE is a special type of explorer who deserves more attention and a more careful telling of his story than we can manage to give him in such a general book as this. This is the climber and explorer who specializes in mountainous regions. He is as distinct a person and he has as separate a technique for his work as the great navigator, the plainsman, the woodsman or the caravan traveler of the desert. The mountaineer-explorer has often begun his career as sportsman and climber but has soon become as well a surveyor, cartographer, geologist or general geographer. He has been no longer content to cross the well-known passes or follow the old arêtes or even to stay in the well-known ranges; he must push out into regions where each day presents a new skyline and each season a prospect of new passes and peaks for conquest.

As an example of this class of explorer we have spoken already of the Duke of the Abruzzi in the Ruwenzori Mountains and the Himalayas. But he is simply a link in a long chain of distinguished men. In the Alps there were De Saussure, the scientist; Balmat, the practical guide who worked on Mont Blanc; Whymper, who conquered the Matterhorn and was an artist and climber, though hardly an explorer. On the other hand, Tyndall, who made one of the great ascents on the Weisshorn, was a geologist and a splendid general scientist. His delightful accounts of his expeditions convey a lively sense of the importance of mountains in the life of man. In the last century, the Alps were the training ground for these and scores of other men who made their Alpine experiences of service in distant mountain ranges. There was Leslie Stephen who traveled widely in the European mountains; A. F. Mummery, who worked in the Caucasus; Douglas Freshfield who went to the Caucasus and Slingsby who worked in the Norwegian mountains. There were Fanny Bullock Workman and W. H. Workman, who made new ascents in the Andes and explored in the Karakoram.

Nor have Americans been wanting from the list of the mountaineer-explorers. Among the conquerors of the Alaskan peaks there have been Miss Dora Kean on Blackburn; on Mount McKinley there have been Professor Herschel C. Parker, Belmore Browne, Thomas Lloyd, Hudson Stuck, and their associates. The tradition is being maintained today by Bradford Washburn and his associates, whose climbs each season are adding the ascent of new peaks and mapping new territories. Also to the credit of American mountaineers is the conquest a few seasons ago of Minya Komba on the borderline between China and Tibet.

Finally, in the years between 1920 and 1930 we have seen the work of that group of great climbers and devoted men who under the chairmanship of Sir Francis Younghusband developed the great series of attacks on Mount Everest. Of course, the crowning glory of these expeditions was the magnificent performance of the young climbers, Mallory and Irvine, who are known to have reached the elevation of over 28,000 feet and who, marching on, gave their lives in that attempt. Nor will the world soon forget the splendid performance of Lieutenant-Colonel E. F. Norton. But the real significance of the Everest expedition resides not only in these spectacular performances but also in the sound scientific work of the reconnoitering and supporting parties that included in their membership Odell, Shebbeare, Bruce, Somervell, Noel. No mere flight over the peak can dull the interest or honor of their performance, nor is it likely to long delay further attack on the mountain. No one, knowing the spirit of mountaineering enterprise, can doubt that the coming climbers will not rest content until man has at last by his own effort set foot at the top of Everest.

Sir Hubert Wilkins (1888-)

IN 1928 Wilkins followed up the Polar researches that had been carried out by Amundsen, Ellsworth and Byrd by making another remarkable passage over the Polar Sea.

Wilkins had originally come from Australia, where he was an expert photographer and news reporter. His first Arctic experience was that with Stefansson in the Canadian Arctic Expedition, where his services were highly valued. Returning from the Arctic work, Wilkins served in the World War with the Australian air service. He had for a number of years taken part both in long-distance flights and in some Antarctic expeditions. In 1926-1927 he began to develop his plans for Arctic exploration by air, working from a region that he knew well at Point Barrow on the Alaskan coast.

In 1928 on an expedition for the Detroit *News* he took his monoplane again to Point Barrow and with Carl Ben Eielson as pilot flew from Point Barrow across the Arctic Sea, sighting the northern coast of Ellsmere Island. He then changed his route, passing in a more northeasterly direction, crossing close to 85° N. latitude and finally landing at Spitsbergen.

He had thus performed another remarkable Arctic flight in an airplane. His passage across the Polar Sea helped to reveal the fact that there was no undiscovered land for a considerable area on either side of his line of flight. It was not Wilkins's intention to reach the Pole or to fly over it, since this had recently been accomplished but, by taking the course he did, he added information about hitherto untraversed sections of Polar territory.

Wilkins had always been interested in meteorological observation and those of the Polar regions were of particular importance to him, as they have been to most recent Polar explorers. It was undoubtedly the desire to obtain marine soundings and a more extensive series of meteorological records that prompted Wilkins to develop his plans for Arctic travel in a submarine. His attempt occupied him for several years and resulted in failure, partly due to the mechanical deficiencies of the submarine in which he sought to make his voyages.

THE ANTARCTIC

THE idea of an Antarctic continent is very old. The belief that the area about the South Pole was occupied by a great land-mass grew up among the classical geographers and has had a persistent but diminishing place in geography ever since. Antarctica or Terra Australis, as it was formerly called, was once thought to be very large and the history of Antarctic exploration has been a slow process of pushing back the possible limits of this land as explorers moved farther and farther into the South Polar sea. Even in recent years this process has been continued on a reduced scale.

Ptolemy (150 A.D.) summed up in a rather imperfect way the teachings of the classical geographers. He was later regarded as a master by the medieval scholars. What he thought about the Antarctic was this: the Antarctic land was so large that there was no Antarctic sea at all. All that area of the world was filled up with a vast continent. Moreover, this land joined Africa to Asia. Ptolemy drew his map so that Africa did not end in a cape. Instead of the shores of Africa running together here they suddenly flared out and reached around the world. The east coast of Africa swept eastward and joined a long southern extension of eastern Asia (an exaggerated Malay Peninsula) so that the Indian Ocean was like a great inland sea. This, of course, was contrary to the experiences of the Phœnicians and the teaching of other ancient geographers. Still, it was for a long time the most widely accepted plan of the southern hemisphere.

When Diaz rounded the Cape of Good Hope and when Da Gama went to India, they proved at least that Africa was not joined to the Antarctic continent. But many still thought that Da Gama had just slipped through a strait that separated these two continents. Likewise, when Magellan went through his Straits it was the general belief that Tierra del Fuego was part of the Antarctic continent. But when Schouten went around the Horn and found only a great ocean south of him, Antarctica had again to be moved farther south.

In the Pacific one island after another was accepted as the beginning of Terra Australis, only to be abandoned when it was circumnavigated and a farther island found. Mendaña and Quiros thought that they had reached part of Terra Australis when they found the New Hebrides. Tasman greatly reduced the possible area which could be occupied by the Southern Continent when he sailed around Australia and showed it was not connected with any other land. But when Tasman reached New Zealand he accepted this as a part of the Southern Continent!

CAPTAIN COOK IN THE ANTARCTIC IN 1772

EVEN by the middle of the 18th century this Terra Australis Incognita was supposed to lie just outside of the routes usually followed by ships in the south Pacific. Captain Cook was commissioned to make his first voyage in 1768 and it was part of his instructions that he was to look for the continent by sailing across the Pacific between 35° and 40° S., until he came to New Zealand. As a matter of fact, he was also instructed to take observations in 1769 of the transit of Venus and for this purpose headed for the Society Islands so that it was only part of his route that added new information about the southern section of the Pacific. Later, on this voyage, he sailed quite completely around New Zealand and also demonstrated the separation of the North and South islands. The effect of this was to decrease again the area that the unknown, unseen continent could possibly occupy.

On this second voyage Cook became the first important Antarctic explorer. He sailed in July, 1772, with the "Resolution" and "Adventure." After stopping in South Africa he commenced to circumnavigate the world in high southern latitudes. He crossed the Antarctic Circle and reached 67° 15′ S., while cruising between Africa and New Zealand. Later he crossed the Circle again between New Zealand and the Horn, reaching 71° 10′ S. He had now traveled nearly around the world below the latitude of Cape Horn and had touched the limit of the pack ice. He thought that to sail farther south would be "a dangerous and rash enterprise." He felt sure he had demonstrated that no southern continent existed unless it lay about the Pole itself. Cook had seen no land but he thought that it was not unlikely that beyond the floating ice lay land and that the icebergs and drift ice which he saw had been formed at the edge of this land and had been broken off and drifted northward by the winds and currents. He thought that the land, if any existed, would offer little more protection to the birds and animals than the ice, since the land itself would be almost entirely covered in snow and ice. In this single voyage Cook had proved that the Southern Continent, as usually imagined before his time, simply did not exist;

he had added positive knowledge about the great Antarctic Ocean and had speculated about the possibility of land beyond the ice near the Pole.

F. G. Bellinghausen in 1819-1821

THIS Russian sailor circled the Antarctic Ocean, many portions of his course lying south of the circle followed by Cook. Bellinghausen sailed far enough south to see land, naming Peter I Island and Alexander I Land.

But by this time American whaling and sealing vessels had already begun to sail among the Antarctic islands. They ran to the Falklands, the South Shetlands, and possibly sailed a good deal farther. Bellinghausen met one of the most enterprising of the American hunters, N. B. Palmer of Stonington, Connecticut, who in 1821 discovered land of some extent. For a time it was believed that Palmer had discovered part of the Antarctic continent, but British writers assert that Palmer discovered only part of Graham Land, which has proved to be an island.

However that may be, the English whalers and sealers were not long in joining the Americans in the Antarctic. Weddell sailed into the great icy sea which is now known by his name and reached 74° 15′ S. That put a deep dent in the Antarctic continent! How the great continent that Ptolemy had blown up out of his imagination was shrinking like a pricked balloon!

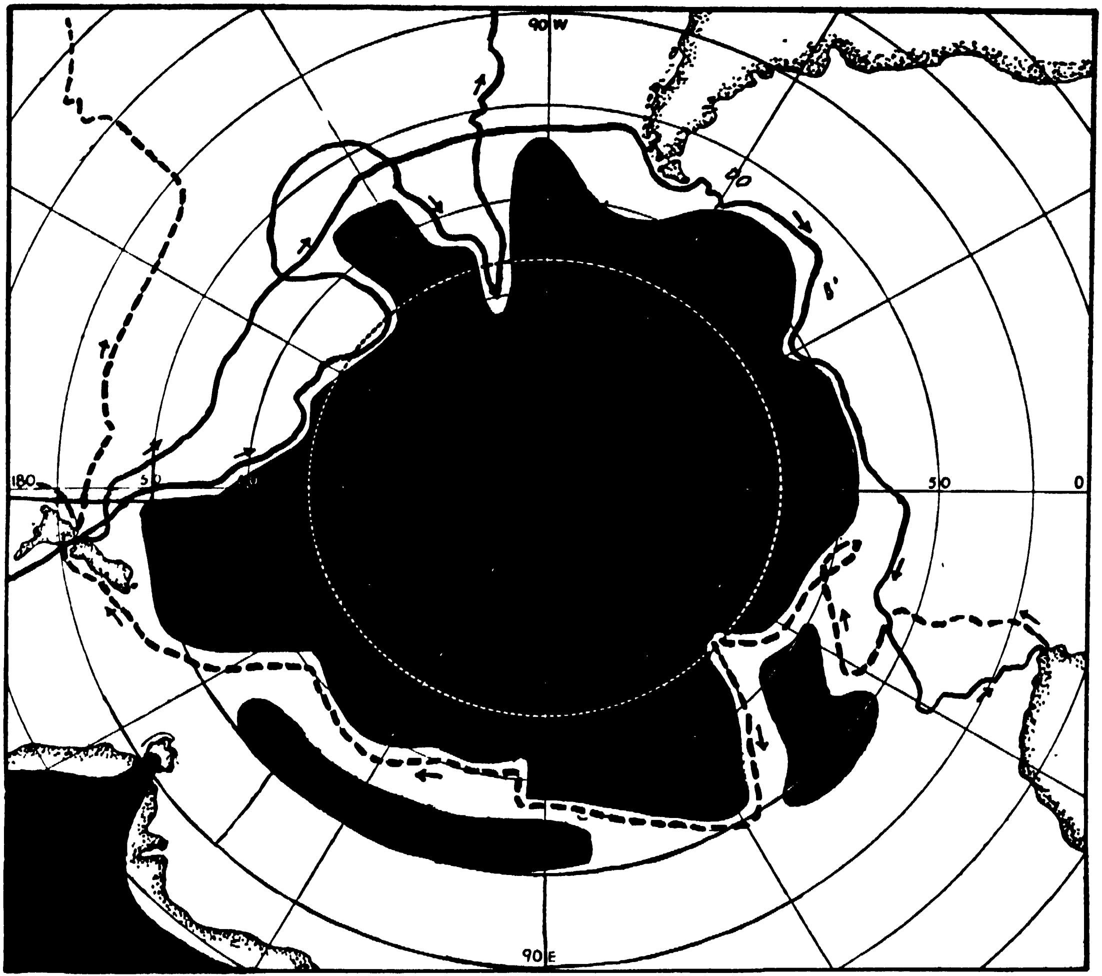
But now a series of voyages quickly showed that there was indeed some reality to the Antarctic land-mass and it began to take a rough shape. A firm of British whalers, named Enderby, ordered their captains, whenever they could reasonably do so, to sail southward and report any discoveries they might make. Thus both new whaling and sealing grounds were discovered and new lands added to the map. One of their captains, Biscoe, discovered Enderby Land and Biscoe and Adelaide islands. Kemp added Kemp Land, a strip of coast lying near Enderby Land. Balleny added a small island.

A United States expedition under Lieutenant C. Wilkes made an extensive cruise in the Antarctic Sea under Tasmania. Here Wilkes took soundings of no great depth, showing that he was on the shelf of the Antarctic continent. He also reported seeing a very considerable coast line. For some reason which is not clear, Wilkes's navigation and the records of his discoveries are not very accurate. For a while Wilkes's name was attached to an extensive section of the Antarctic coast, but Sir Douglas Mawson and other explorers and critics cast doubt upon Wilkes's discoveries and show that some of them do not exist. At least they have shown that they do not exist in the location in which Wilkes reported them. Ross later sailed over an area on which Wilkes had recorded on a sketch-map land and a range of mountains. So the length of coast line assigned to Wilkes's name has gradually been nibbled away and new names assigned by later voyages. Wilkes, however, made a long voyage under great difficulties with vessels not very adapted to his task. He threw new light on conditions in the Antarctic and directed attention to new coast lines.

Sir John Ross (1777-1856) and Sir James C. Ross (1800-1862)

SIR JAMES CLARK ROSS participated in at least seven Arctic voyages and three voyages in the Antarctic. It is for the three voyages in the Antarctic, which were carried out under his own command, that he is best remembered. He was one of the great ice navigators of his own, we might almost say of any, time. On his first voyage he opened up a way to the Antarctic continent which has so far proved the most practicable one and has been used by many explorers.

Ross was 12 years old when he entered the



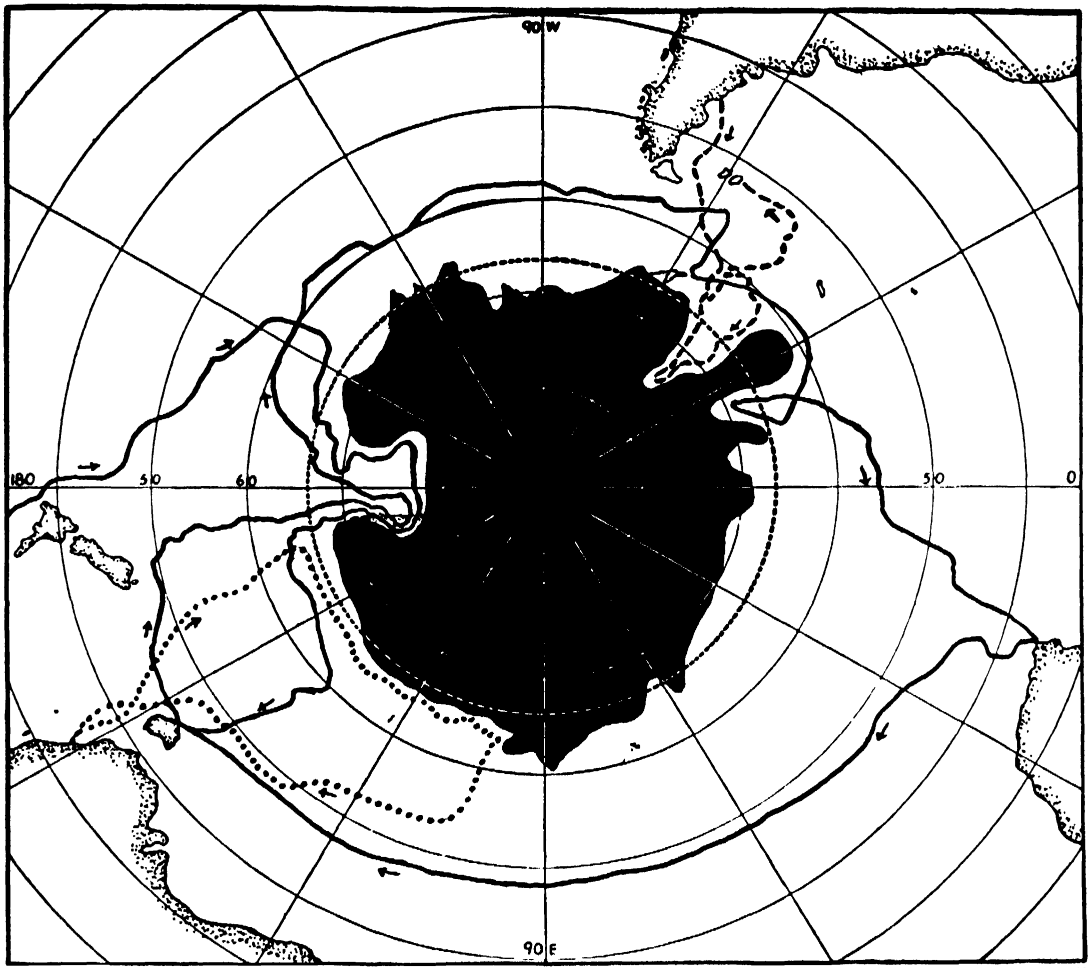
Simplified and re-drafted after Mill

COOK—1775

First Cruise, 1772-3
Second Cruise, 1773-5

navy and was attached to the command of his uncle, Captain John Ross. He was only 18 years old when this uncle started on his first Arctic voyage in 1818. Young James accompanied him on the "Isabella" and had the experience of sailing in Baffin Bay and of participating in the exploration of a portion of Baffin Land. At this time Captain John Ross was not very experienced in Polar navigation and he did not, as he might have done, pass into Lancaster Sound. He thought that there were shallows and land lying across the entry and cautiously returned home with little really accomplished. But young James Ross had seen the ice-pack and the great bergs and watched the ship fight her way through storms and fogs and against strong currents. He had already had the taste for this kind of work. He was to see plenty of it!

A year later he was with Parry back in Lancaster Sound. This time the ships crossed the Sound and pushed through a strait which they named Barrow Strait and which was found to lead westward for 630 miles. They explored the coast of Bathurst and Melville Island and spent a winter on Melville Island which Parry explored to its northern shores in the spring. When the



Simplified and re-drafted after Mill

1845

- - - - - - - Weddell, 1820-4
. . . . Wilkes, 1839-40
——————— Ross, 1840-43

ship returned to England, Ross had the satisfaction of seeing his commander receive the Parliamentary prize of £5,000 as being the first man to pass west of the 110th Meridian west.

Then Parry scarcely had time to file his report and to equip two ships, the "Hecla" and "Fury," and get ready for another exploration in 1821. Young Ross was still in his company. This time they discovered the Hecla and Fury Strait which separates Baffin Island from the Melville Peninsula. In 1824 they were on a new voyage to Lancaster Sound, trying for another passage westward. This season the ice conditions were very bad and they accomplished little. It was a new lesson for James Ross when the "Fury" was wrecked, and, after 25 days of continuous effort to save her, abandoned.

He joined again the command of his uncle in 1829 and on this expedition carried out important and independent work on his own account. The ship of this expedition was the "Victory," a very small vessel equipped with paddle wheel and a small steam engine. This was a first and futile attempt to use auxiliary power in a ship of exploration. The engine failed and was discarded. The vessel penetrated Prince Regents

Inlet beyond the spot where the "Fury" had been wrecked. They named Boothia in honor of Sir Felix Booth who had promoted and backed the expedition. James Ross made journeys on land and first definitely located the North Magnetic Pole. He also discovered and named King William Land and explored a portion of it. The expedition spent four consecutive winters in this region. The "Victory" had to be abandoned and the Ross party was finally picked up by a whaling vessel that reached Lancaster Sound. This ship brought them back to England.

Shortly after his return James Ross was made a captain and in 1835 he was given command of an expedition and ordered to sail the Antarctic. His vessels were the "Erebus" and "Terror," two stout old navy bomb-ketches that were slow and heavily built but proved themselves reasonably good ships for dealing with the ice. Ross commanded the "Erebus" and Crozier the "Terror." The purpose of the expedition was to study the earth's magnetism by making an extensive series of observations in high southern latitudes. The Admiralty had confidence in Ross and fortunately drew his instructions so that he was given a good deal of freedom in laying his courses and carrying out his trip. Having found one Magnetic Pole, Ross himself was delighted at the opportunity of chasing another one. It seemed to him wise, if he wished to come as near as possible to the Magnetic Pole, to avoid the region where Wilkes had reported sighting land by keeping farther to the eastward.

In January of 1841 Ross encountered the ice-pack. It was now that Ross's resolution, character and experience had an opportunity to assert themselves. He sailed boldly into the ice-pack and forced his way through it. A careful reading today of the accounts of the expeditions of Scott or Shackleton or Byrd or Wilkins or Ellsworth will demonstrate that it is a difficult matter to negotiate the Antarctic ice-pack, even with vessels that have modern engines and plenty of power at their command. Ross's sailing vessels had no auxiliary power whatsoever. He was handling square-rigged vessels that had a limited ability to work to windward so that his range of possible movements was a good deal restricted. He was headed into an icy sea that few vessels had coped with successfully. None the less he took his ships boldly into the pack, was able to work his way southward through the ice and finally emerged into an area of open sea. He rounded Cape Adare, followed the cape southward, still sailing in open water, and at the end of January was rewarded for his enterprise by observing to the south of him over the bow of his vessel two lofty snow-covered peaks rising apparently abruptly out of the ice and sea itself. These peaks were approximately 7,000 feet and 10,000 feet in height and one of them was a volcano. It was active at the time, throwing into the air steam and smoke and fine volcanic ash, the dark cloud hanging in impressive contrast over the brilliant white snow-fields and glaciers. Ross named the peaks Erebus and Terror to honor the vessels that had brought him to this strange corner of the world.

Ross took his magnetic observations and examined the shore about him. His observations and calculations showed him that the South Magnetic Pole lay apparently well in the interior of the land which was protected by glaciers and ice-barriers and mountains. So far as his purposes were concerned at the time the South Magnetic Pole was inaccessible. He cruised about in the great sea that now bears his name and examined the formidable ice-barrier, which closes that sea to the south, rising to a height of 150 to 250 feet and extending across the sea for nearly 300 miles. Ross reached 78° 4′ but found no way of penetrating the ice-barrier and no hospitable spot for winter quarters. He turned north again, worked his way through the ice-pack and took his ships to Tasmania.

Ross made two further attempts to sail southward toward the Pole. The first of these was made

1,400 miles farther to the east than the course of his first voyage. This time the water was against him and he had a long slow trip. But he kept at it and on this occasion reached 78° 9′ 30″ S., thus breaking his own record and coming nearer to the South Magnetic Pole than any previous voyager. His third voyage was made in the Weddell Sea area and, though it did not result in any new discoveries of land, it permitted him to carry on his magnetic observations in a new sector.

It is hard today to understand or to convey a sense of difficulty of the conditions that Ross faced in his Antarctic voyages. Before the opening of the Panama Canal and the Suez Canal ships were passing frequently about both southern capes and many travelers had experienced the enormous seas and the persistent gales that characterize the high southern latitudes. They had therefore some idea of the type of sea and weather that the Antarctic could produce for long periods of time and on a tremendous scale. Today I should judge there was a diminishing number of people who had been "south about." Even the men who have composed recent exploring expeditions to the Antarctic have grown used to passing through ice under power rather than depending upon sail. But two of the life-and-death moments Ross faced with courage and overcame with great ingenuity help to tell the story.

In one case the ships were traveling together through the ice-pack when a tremendous and continued gale hit them. The blocks of ice through which they were passing were very large and weighty, but the pack was unconsolidated and open. Now, a close pack can be counted on more or less to dampen the effect of great waves, even when there is gale blowing. In this case tremendous waves swept under the ice and the huge blocks were hurled about with great violence. Ross records that when the two ships were each on the crest of adjacent waves a great ice-filled abyss yawned between them. Into this abyss the ships threatened at any moment to plunge and to be swept together into collision. Yet, when the waves passed and each ship went into an opposite trough an observer on the deck of one vessel could scarcely see the topmasts of the other. The ships were so little manageable, that it was difficult for them to spread to a safe distance. Both ships sustained serious injuries to their rudders and rudder posts from the impact of the ice-blocks. Finally, when the gale abated, they were able to pass on opposite sides of a large and more or less stable ice-floe. They closed in on opposite sides of this floe and made fast. This gave them some steadiness for the operations which now ensued. In the period of several days during which they lay at the floe, the rudders and rudder posts of both ships were removed and in this time, with the carpenters and metal workers working furiously and almost continuously, they succeeded in repairing the rudder of one ship and fitting a new rudder for the other and in building a complete new rudder to be carried as a spare in case of further emergencies.

On another occasion both ships were running in half-darkness before a gale when a great wall of ice suddenly loomed before them, the breakers roaring and beating against the perpendicular surface of what appeared to be an enormous berg. Ross in the "Erebus" hauled the wind on the port-tack in an attempt to weather the berg. He thought this maneuver was about to prove successful when he suddenly saw the "Terror" come out of the darkness driving straight for his ship. The "Terror," which had been on the port-hand, had also seen the berg and without knowing the exact position of the "Erebus" had elected to round-to on the starboard tack. Ross laid the sails of his vessel aback but a collision was inevitable and the ships met with great violence. The "Erebus" lost her bowsprit, fore topmast and a number of light spars. The impact was so violent that the fluke of an anchor, which the "Erebus" carried slung overside, was driven completely through her stout planking. It was carried this way for 800 miles before it finally worked loose and dropped into the sea.

After the collision, the rigging of the two ships was entangled and engaged, so that neither could maneuver. Each passing wave hurled the two ships together with great force so that there was a continual crash and uproar of breaking spars and crushed boats. During this period the ships were drifting together toward the breaking waves and the wall of ice. The "Terror," which was the least damaged, worked free and began an attempt to weather the berg. The "Erebus" was unable to tack and had no room to wear ship, for by this time she was at the foot of the ice cliff itself. In this emergency Ross laid his sails aback, braced them sharp up and boarded his tack in an attempt to make stern-board. This he succeeded in doing and with the aid of the backwash from the waves breaking on the face of the cliff he was able to work his way backward along its foot without serious collision. Fortunately, by this time a gap in the wall of ice presented itself. There was a dark opening and a chance at least that this opening represented a small space of clear water lying between two bergs. Ross took the only chance available and let his sails fill again, gathering headway, steering for the dark opening. Fortunately, it was two bergs he was facing and not a single one. With great presence of mind on his part and smart work by the crew, they worked the ship through a channel that was scarcely three times the width of the ship herself, waves and spray sweeping over her from stem to stern until she passed into the lee of the bergs. When the "Erebus" had worked free of the bergs, she lit a flare in an endeavor to ascertain what had happened to the "Terror." A moment of suspense passed and then through the darkness came an answering flare from the "Terror." She had succeeded in working to windward and clearing the bergs!

Ross brought his ships back to England in 1844, almost exactly four years after he had left home. He was knighted and in other ways rewarded for his extraordinary accomplishment.

Ross settled down to duties at home and was called to turn his ships over to Sir John Franklin for his attack on the Northwest Passage. He was glad to be of service to the man who had been of such assistance to him and who had taken so friendly an interest in all that he had to report when they stood together on the deck of the "Erebus" in Hobart, Tasmania. But as time went by and nothing was heard of Franklin, Ross's pleasure turned to anxiety and the anxiety to grief. He knew that something must be done and in 1848 he took out the "Enterprise" on a first search and relief expedition looking for Sir John Franklin. Two years later Sir John Ross also heard the call and roused himself and took out an expedition. He was then 73 years old.

The Rosses had then each sailed in the Antarctic and the Arctic and had made important contributions to the maps of those regions. The circle had come full round and in the end tragedy and duty had called these explorers back to the icy waters in which they had together begun auspicious careers.

OTTO NORDENSKJÖLD (1869-1928)

AT the beginning of the 19th century a number of Antarctic expeditions were building up bits of information about the various scattered coasts of Antarctica. The expedition of Dr. Otto Nordenskjöld of Gothenburg was not in any way the most important but it was certainly one of the most dramatic and extraordinary of all the adventures in the Antarctic. Nordenskjöld left Gothenburg in October, 1901, in the ship "Antarctic." In addition to the crew, he had with him in the party eight or ten scientists. They sailed for the New Hebrides and part of Louis

Philippe Land was explored. They passed into Weddell Sea and Nordenskjöld and five men made a landing, established a station and planned to spend the winter. The "Antarctic" was to sail north and to return for them the following year.

Nordenskjöld's camp was established on a little island named Snow Hill. His quarters for the winter were not very elaborate and the winter was an extremely cold and stormy one, gale after gale sweeping over them. None the less they preserved their health and cheerfulness and carried on such scientific work as conditions permitted.

All that summer they waited in vain for the "Antarctic" and at last it became clear to them that the ship was not going to return and they began preparing for a second winter, though all their equipment had been calculated for one winter only. They did this with extraordinary ingenuity, resource and energy. They not only got through the second Arctic winter but even managed to keep healthy and reasonably cheerful. This in itself is a remarkable record of successful adaptation to Antarctic conditions.

In October of 1903 Nordenskjöld was away from Snow Hill, exploring Mount Haddington which he discovered to be an island surrounded by the Arctic ice. Moving about the island he was amazed suddenly to see the approaching figures of three men. They were so bearded, savage and dirty in appearance that it was some time before he recognized them as members of his original party: Gunnar Andersson, Lieutenant Duse, and a Norwegian sailor, Grunden. There were great rejoicings on both sides and eventually explanations followed. In 1902 the "Antarctic" had tried to reach Snow Hill, but ice conditions had been very bad. Andersson and his companions had been landed on the ice before the ship had to turn back and abandon her attempt for that year. It was their purpose to reach Snow Hill, to report the situation to Nordenskjöld. They had been caught on Mount Haddington, had built a stone hut and had somehow lived through the winter.

The happy united parties returned to Snow Hill, hoping that some time the "Antarctic" would return to rescue them. On November 8, 1903, an unexpected arrival came to Snow Hill. The little party of three men seemed to be accumulating recruits in the heart of the Antarctic at a surprising rate. The new arrivals were the party of Captain Irizar. Having had no word from the Nordenskjöld expedition the Argentine government had grown alarmed and had sent Captain Irizar in command of a gunboat, the "Uruguay," to investigate and if possible to effect a rescue.

This was very welcome news save for the fact that it raised the problem of where Captain Larsen and the "Antarctic" could be all this time. There was doubt as to the "Antarctic's" fate and question of what should be done. That very night Captain Larsen himself and five men walked into the camp on Snow Hill!

The party was now complete and reunited. Larsen reported that in 1902 the "Antarctic" had been caught in the pack before he could escape and had sunk, but he and the crew had landed on the ice. They had reached land; had also built a storm hut in which they passed the winter; had also foraged for themselves successfully and survived. The combined parties were brought back to South America by Captain Irizar on the "Uruguay."

Much of the scientific work of the Nordenskjöld party was lost when the "Antarctic" sank. But he and his men had given an unparalleled example of courage and of successful ingenuity in facing Antarctic conditions with the minimum of equipment and resources.

CAPTAIN ROBERT FALCON SCOTT (1868-1912)

It was in 1901 that Scott, a young English naval officer who had been appointed commander, led his first Antarctic expedition. Among the men associated with him were a number who were to make independent reputations in discovery, such as Shackleton, Wilson and others.

Scott sailed from England in August, 1901, in the ship "Discovery." He went through the ice-pack and reached Cape Adare January 9, 1902. He carried out considerable work in the Ross Sea area. On the eastern side of that sea he discovered and named King Edward VII Land. He then crossed to the other side of the sea and examined McMurdo Sound and the region about Mount Erebus and Mount Terror. He showed that these peaks stood on an island to which he gave the name Ross Island. From this region as a center he undertook in the following summer to make a number of expeditions on the Antarctic continent. Scott, Shackleton and Wilson made a journey to 82° 17′, which was the farthest south at that time. In 1903 he traveled to the eastward on the high plateau. The "Discovery" party returned in 1904, having done a good deal to display the character of the Antarctic continent.

SIR ERNEST SHACKLETON (1874-1922)—EXPEDITION OF 1908

SHACKLETON had been a member of Scott's expedition in 1902 and had been with him on his southward dash. In 1908 he led his own expedition, having among its members Professor T. W. Edgeworth David and Douglas Mawson (both later knighted). Shackleton entered the Ross Sea and made his base at McMurdo Sound, as Scott had done. From this point he undertook a dash for the Pole.

Unfortunately Shackleton had carried with him a number of Siberian or Manchurian ponies and had become persuaded that he could depend on them for transport rather than on dogs. Had he not done so his chances of reaching the Pole would have been greatly enhanced. Shackleton, of course, could not foresee all the conditions he was to encounter. The ponies did quite well for a while, and then began to be unequal to the demands made upon them. The fact that special imported food had to be carried for the ponies, whereas dogs could live and thrive on dried fish, seal meat, whale meat, or even dog meat, makes the dog the preferred animal for Polar travel. Also, when the party reached the mountains and began the ascent of the Beardmore Glacier the ponies proved useless and had to be abandoned. By the time they had reached 84° S. all the ponies had died. This, of course, was just the point where the men most needed draught animals. The men thereafter had to drag the sledge with their equipment.

It took them 17 days to reach the plateau and it is little less than a miracle that they were able to continue over the snowy plain to within 97 geographical miles or 113 statute miles of the Pole. Here Shackleton and the men met heavy weather and it became clear that the slow pace which was all that they could manage would never bring them to the Pole and back in safety. They had to turn about and make their way back to the McMurdo Sound base, walking and dragging their sledge themselves. In all they had traveled over 1,725 miles, had established a new record for Antarctic work and had seen and reported for the first time the great south polar plateau. The peculiar conditions of the trip, the endurance and courage of the men, heightened the interest if not the scientific value of the trip.

In the meantime Professor David and Douglas Mawson had been kept at the base. But they had not been idle. Having an important piece of work before them and no dogs or ponies at their disposal, they also had harnessed themselves to a sled, dragged it up on the Barrier and on the Western Plateau, made a trip of 1,260 miles and reached and located the South Magnetic Pole. Sir James Ross had been the first to seek the South Magnetic Pole and had been greatly disappointed to find it hidden far inland and, so far as he could see, inaccessible. Men walking and dragging all their food, extra clothing and scientific equipment had found it!

Shackleton's expedition nearly hangs up a record for the conquest of handicaps by hard slogging.

AMUNDSEN TO THE SOUTH POLE, 1911-1912

IN 1910 Amundsen was planning another expedition, a drift across the Pole along the lines Nansen had developed. He was already fitting out the old "Fram" for this trip when word of Peary's discovery of the North Pole reached him. With extraordinary courage and independence he shifted his line of attack to the South Pole and reformed the plans of his expedition. He knew that Scott had already started with an elaborate and well-financed English expedition but believed that his own simple and conventional methods of travel gave him an opportunity to succeed. He kept the change of plan to himself and it was only when he was near Cape Horn that he informed his assistants of the new objective.

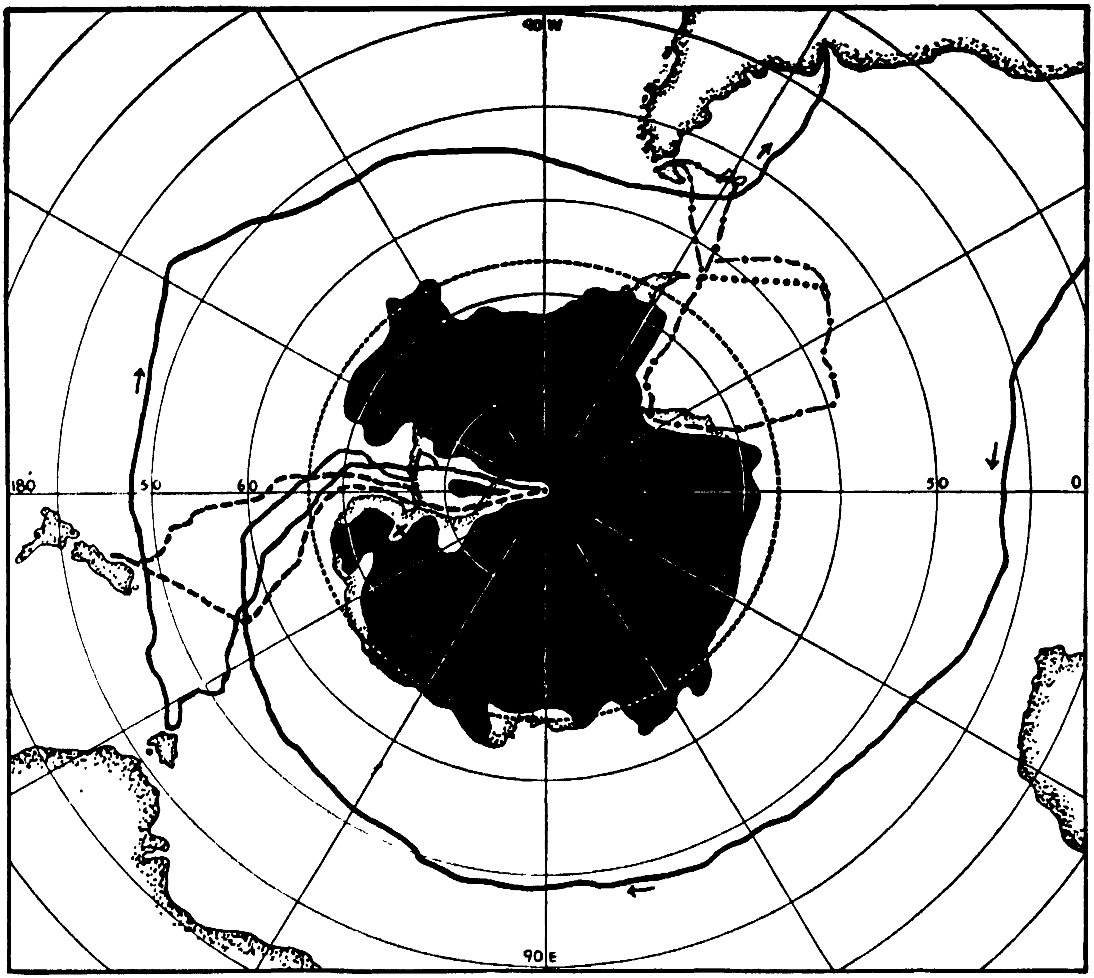
The "Fram" took him to the Bay of Whales and he established a camp called Framheim upon the great barrier. The "Fram" sailed away with plans to touch at Buenos Aires and then carry out oceanographic work between South America and Africa. She was to return for them the following year. Before the season closed, Amundsen and his men made southward journeys establishing three depots of food and supplies on the proposed route to the Pole. These depots were carefully marked before winter closed in and were waiting for them when the spring advanced again.

In the hut that they had built before the "Fram" departed they passed a successful and cheerful winter planning and refitting their equipment and carrying out a program of meteorological and other scientific subjects. Apparently the winter was not an especially severe one. Amundsen reported only two great storms. Temperatures however were low, there was a considerable period of time when temperatures ranged between —58° and —74° Fahrenheit. The health of the party remained good and all the men were fit for their part of the undertaking when spring came after four months of continued darkness. The dogs on which Amundsen depended for transport also survived the winter well.

Early in September there was a spell of fair weather and Amundsen determined to start the dash for the Pole. He departed from Framheim on September 8th. After making considerable progress a storm descended on them at one of their stations. The men survived the storm well but the dogs could not be protected, suffered seriously and lost weight. Amundsen returned to his base to permit them to recuperate. A second start was made on October 20th and progress was rapid. On this second and final advance Amundsen had decided to reduce his party to five men. Three men, with Lieutenant Prestrud as leader, were left at Framheim to carry out a trip to King Edward VII Land.

By October 22nd, Amundsen had reached the station at 80°, and by October 31st they had reached the station at 81°. As Amundsen advanced he lightened his loads and left a cache of supplies for the return journey at each degree-station. They reached 82° on November 5th, 83° on November 9th, 84° on November 13th, 85° on November 16th. Here Amundsen established a main depot and here a rest was taken.

The camp at 85° was already at some elevation and before them lay the great range of mountains that led up to the tremendous Antarctic plateau. From here the going was more and more difficult and they had frequently to work their way up



Simplified and re-drafted from maps of the American Geographical Society

1920

——————— Amundsen, 1910-12
— — — · — — — Scott, 1910-13
— · — · — · — · — Shackleton, 1914-16
.... Shackleton Boat Trip, 1914-16
× David—S. Magnetic Pole, 1908

steep glacial slopes, on the steepest portions of which 20 dogs were required to draw a single sled and the party had to proceed in a series of relays. By November 25th they were working their way over the crevasses of a great glacier which Amundsen christened the Devil's Glacier. The lofty mountains on his left that stretched away in a southeasterly direction he named the Queen Maud Mountains. They were climbing first to 7,600 feet, then to 8,000 feet, then to 9,370 feet. On December 2nd they camped at an elevation of 11,075 feet in latitude 87° 51′.

From here the plateau dipped slightly toward the Pole and then there was a vast plain of snow before them with almost level travel. On December 13th they pitched camp at 87° 45′. The next day they were at the Pole on a great plateau, 9,000 feet above sea-level.

Amundsen established a camp in the vicinity of the Pole which he called "Poleheim" and there he spent the days from the 14th to the 17th in December of 1911. During this time he and his men carried on a long series of astronomical observations to be sure that they had located the Pole with all the reasonable accuracy their instruments permitted. They built a cairn, pitched one of their tents, deposited in it records and a letter to be collected by the next arrival at the Pole and delivered to the King. They also left a cache of supplies, clothing and spare scientific instructions for the use of the next party. They sent out men from this camp in four directions who erected markers at the end of 5-mile marches so that they covered a considerable area in the vicinity of the Pole.

Then they turned back and made a safe and speedy return to Framheim. Their trip in either direction was calculated at 870 miles. On the trip out they averaged 15½ miles and on the return 22½ miles a day. Amundsen planned his whole trip with remarkable precision. In his original statement he proposed sailing from Norway to arrive at the Bay of Whales January 15, 1911. They arrived there the 14th. When he left Framheim he planned to make the Pole on December 15th. He actually arrived there December 14th. Amundsen owed his success to the fact that he wintered at the Bay of Whales, nearer to the Pole than McMurdo Sound, and to the fact that he used dogs, the most economical and best-tested form of transport on ice, and above all to his long experience in Arctic work.

The news of Amundsen's success astonished the world. Little attention had been paid to his departure and only a few who knew the man and his previous accomplishments believed that he would reach the Pole. The attention of the newspapers was more directed to the enterprise of Captain Scott.

SCOTT TO THE SOUTH POLE, 1911-1913

AFTER Scott's return to England in 1904 he continued for many years his career as a naval officer, in which he progressed rapidly and established for himself a reputation for steadiness and competence. But during this period of naval service he never quite forgot his experience in the Antarctic and from time to time he turned his attention to plans for further Antarctic conquests.

In those days the motor car was just becoming an effective means of travel and Scott devoted much of his attention to developing forms of motor transport. These included the development of a motor-tractor with a caterpillar tread. These machines on his later trip developed mechanical trouble and were a source of annoyance and delay and disappointment to Scott. He counted on them and they failed him, but it is interesting to note that as these lines are being written, Admiral Byrd in his Antarctic work of the year 1934 is reintroducing the use of motor-tractors in the Antarctic, apparently with some success.

While he was working on his plans, his former associate, Shackleton, made his remarkable voyage of 1908. This stimulated Scott to further efforts to complete his plans and organize his expedition and no doubt Peary's success in reaching the North Pole spurred him, just as it did Amundsen.

After the usual difficulty in financing and organizing his expedition and assembling his extensive equipment on board his ship, the "Terra Nova," Scott started off in 1911. He decided to establish his base at McMurdo Sound and to follow the general route that Shackleton had traveled, ascending to the Polar plateau by way of Beardmore Glacier.

Like Shackleton, Scott had trouble with his transport. Scott depended on ponies and dogs and motors and this mixed system accounted for a great many of his difficulties. The ponies were not adapted for glacier work, the motors failed, and not enough attention had been devoted to the dogs. Scott and four companions had to bear all the heavy work of transport as well as of travel. They struggled up the Beardmore Glacier and across the Polar plateau under rather adverse weather conditions and with their strength and supplies both weakening. It was then late in the season and it was a race with time. They pushed on to the Pole, knowing quite well that there was doubt as to whether they would ever be able to make the return journey to their base successfully.

Their somewhat desperate frame of mind was cheered as they progressed and saw that they were nearing the Pole. Then in the distance they saw a slight irregularity in the vast surface of the snow-plain. They approached this and found it to be the tent that Amundsen and his men had erected. They found the tent strongly placed and erect and with all the equipment and supplies and the messages intact. Scott took the letter for the King as he was requested to do and the party faced about for another long struggle back to their base. It was January 17, 1912. There was not a moment to lose.

On the return trip the food gave out, the men gradually weakened with the long days of tugging at the sledge, and illness and frost-bite seized them. A series of storms set in and they were frequently delayed on this account. As they went on they were forced to lighten their loads as much as possible and were still unable to keep up with the required pace. Descending Beardmore Glacier one of the men went out of his head and finally died. Oates, suffering from a frost-bitten and mortifying leg, required much attention which the other members of the party gladly gave him. But he saw that he was impeding progress and one night, while the others were sleeping, crawled out of the tent and walked out into the storm to perish. Scott and his last companions pushed on, struggling with a succession of blizzards. They were only a few miles away from one of the food depots which would have replenished their supplies when a 9-day storm descended on them. There they died. But the party had maintained their courage and to the end Scott kept a careful record of their activities and wrote full letters and instructions.

The story of Oates's sacrifice and the journals of Scott are among the most courageous and the most tragic in the whole history of exploration. The significance of Scott's expedition can only be understood by reading them in detail and for that reason they are not quoted here.

The men at Scott's base camp carried out a considerable amount of scientific work, stayed through the winter season and in the next spring found Scott's camp and recovered his records and such scientific specimens as had been preserved.

SHACKLETON AGAIN—1914

EVEN after Amundsen and Scott had reached the Pole there was still a great task to be carried out in the Antarctic. Indeed, these marches had just opened up one sector of the Polar plateau; it was not known how it terminated on the other side of the Pole or how far the mountains on either side of the glacier reached, or what finally was the character of the whole region between the Ross Sea and the Weddell Sea.

Shackleton set himself the task of attacking this main problem of discovering the character and extent of the Antarctic continent. He planned to enter the Weddell Sea in one ship, the "Endurance," to march across country and to join a second ship, the "Aurora," in the Ross Sea.

The plan was a bold one, the parties large, and the arrangement extensive. Shackleton in the "Endurance" entered the Weddell Sea and forced his way well into the pack and pushed on but was unable to effect a landing on shore. The ship was beset and subjected to very violent and irregular pressure in the pack. She drifted northward but before she could be unladen and a proper base established, she was tossed and turned and damaged and finally shaken to pieces and sunk.

Three small boats and some provisions and equipment had been removed to the ice and here Shackleton and his shipwrecked men set up a camp. For months they lived on the ice, drifting with the pack in an irregular way in a northerly and westerly direction.

By the time the ice began to loosen and the pack to break up, they were not far from Graham Land or Louis Philippe Land. Shackleton succeeded in embarking his party in the small boats by steering through the drifting ice, making their way some 200 miles to Elephant Island. Elephant Island lies north of the South Shetlands, a tiny island, little more than a steep, rocky, mountainous top rising sheer above the storm-swept sea. Here, with the icy mountain towering behind them and the icy sea breaking before them, the party landed and made camp on a narrow beach.

Here Shackleton left encamped most of his party while he undertook a desperate voyage in search of aid. In one of the small boats, the "James Caird," Shackleton prepared to cross the open Antarctic Sea. The boat was like an open ship's lifeboat and not a very large lifeboat at that. But with the help of the ship's carpenter they made a framework over her from gunwale to gunwale, fore and aft, leaving a small rectangular opening amidships. This they covered with canvas from an old ship's sail. They rigged mast for her and fitted small sails. With a crew of five men Shackleton pushed out into the storm-swept Antarctic Ocean. For a while they had favorable wind and made reasonable progress, though they were much rolled about, were always cold, and seldom able to find rest in their cramped wet quarters below deck. Then for six days they had continuous storm. They could not carry sail to keep her head to wind and they had no sea anchor. Waves and spray swept over them. The spray froze on her and sheeted her in ice so that she grew heavy and refused to rise to the swells. The men had to take turns crawling about her and chopping off the ice to restore her buoyancy somewhat. They lived through the storm, sailed the 750 miles between Elephant Island and South Georgia and so completed one of the most remarkable, though not one of the longest, small-boat voyages on record.

Their trials were not, however, ended. Unfortunately they had been able to land only on the bleak, uninhabited and almost unknown tip of South Georgia. The six weary, exhausted and half-starved men succeeded in beaching their boat, drawing her up under some cliffs and making a kind of shelter of her. Here Shackleton left three of his men while he himself with two companions undertook to cross the island. South Georgia is composed of rocky, steep and lofty mountains, rising in a very irregular pattern, the peaks partly covered in a sheathing of ice and snow and the valleys occupied by glaciers. Shackleton threaded his way through and over the mountains, worked his way down the steep cliffs at the other end of the island and appeared at the whaling station at Stromness like a man dropped from the moon.

Once the captain of the station recognized Shackleton and could comprehend his story, a ship was hastily equipped and sent around South Georgia to rescue his men from their uncomfortable and dreary quarters under the upturned boat.

In the meantime Shackleton had to face the problem of rescuing the 70 odd men still marooned on Elephant Island. Shackleton started at once for the Falkland Islands, when he began calling on his own and various South American nations to assist in rescue operations. He made four attempts in various vessels to reach Elephant Island and finally succeeded in the small iron tugboat, the "Yelcho," of the Chilean government.

In the meantime the Ross Sea party of his expedition had not returned and word reached Shackleton that his second vessel had been damaged and disabled. This party was also finally rescued.

Many of the men in Shackleton's party reached England in time to play an active part in the World War. One of the strangest parts of their whole experience was that of coming back from the white wastes of the Antarctic to a Europe so altered, so savage, so shaken.

Despite its record of hardship and disaster this expedition was not without scientific results. The Ross Sea party had advanced to Mount Hope in 83° 30′ S., and Shackleton, by charting the drift of the "Endurance" and of his camp on the ice-pack, had added information about the Weddell Sea and its currents.

Shackleton started on another expedition in the "Quest" in 1921, but died at South Georgia on the way out.

South: The Story of Shackleton's Last Expedition 1914-1917, published in London, 1919, is a fine record of courageous adventure.

Byrd in the Antarctic in 1929

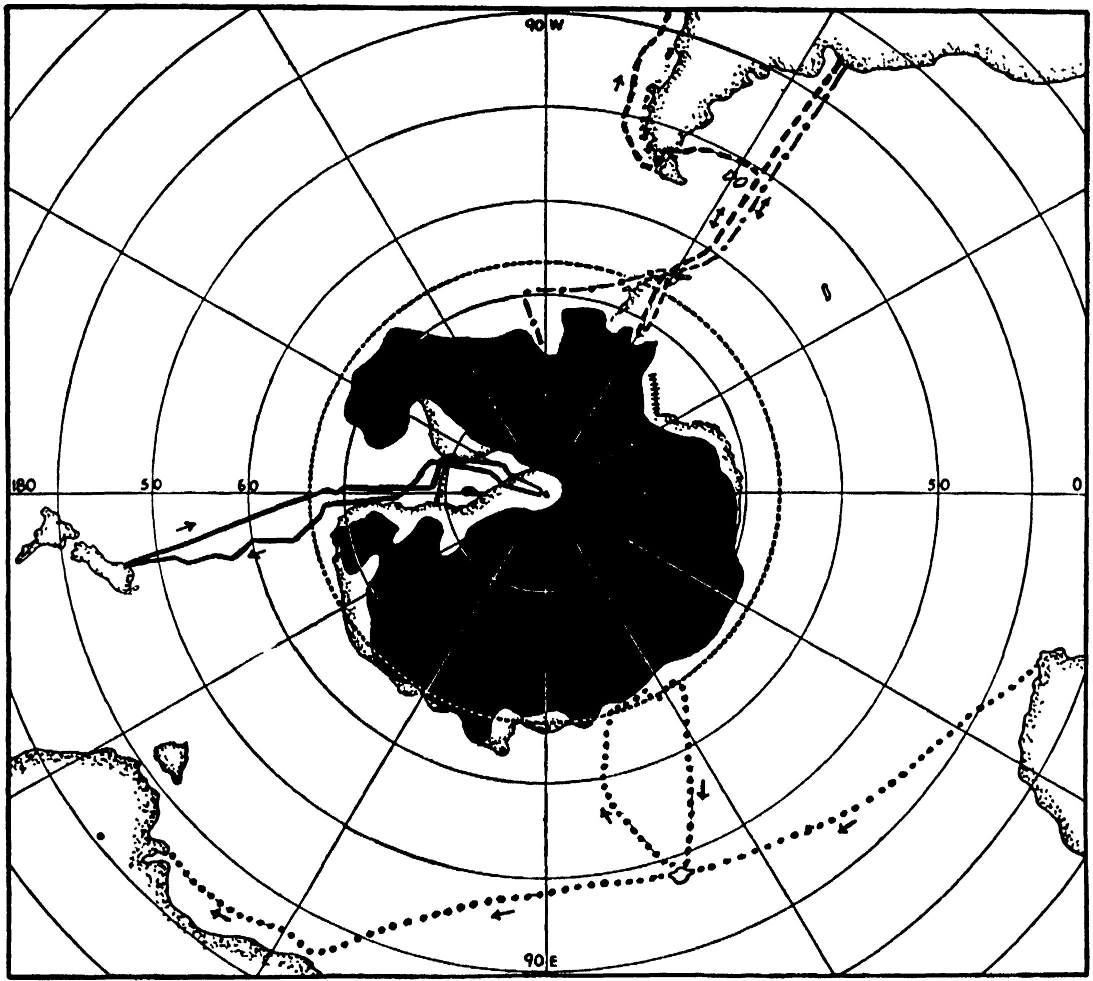
In 1928 Byrd was resolved to follow up his successful North Pole flight with an expedition in the Antarctic. This time, instead of making a mere spectacular flight to the Pole and back, he organized a very large expedition with a definite schedule of scientific work in several fields. The total personnel of the expedition was approximately seventy-five men and in addition to the four airplanes which were taken to the Antarctic provision was made for sledge travel as well. Two of the four ships of the expedition, the bark "City of New York" and the "Eleanor Bolling," landed parties at the Bay of Whales in the Ross Sea in December, 1928. Little America was established very near to the point Amundsen had selected for his camp, Framheim.

Supply depots were laid for the proposed flight, some of these being established by sledge trips and some by preliminary airplane flights. The flight to the South Pole on November 25, 1929—that is in the spring—was successfully carried out. A full photographic record of the flight was kept and aerial photographs as well were taken for the making of a map of a very extensive region. Those in the plane with Byrd included Bernt Balchen as pilot, Harold I. June, assistant pilot and radio operator, Captain Ashley C. McKinley, photographer and aerial surveyor.

In addition to the Polar flight a very important geological expedition by sledge was carried out to the Queen Maud Mountains. This party was under the direction of Dr. Laurence M. Gould, second-in-command of the whole expedition. Other flights were undertaken to the northeast, beyond King Edward VII Land and to the westward over the Ross Barrier as far as Discovery Inlet. The excellent mapping and photographic results were due to the skill of Captain McKinley.

At Little America biological, meteorological and magnetic observations were made throughout the winter. Considerable research was also done on the scientific as well as the practical side of radio communication and one of the special features of the expedition was its continuous, successful communication with the radio station of the New York *Times*.

Admiral Byrd is now in the season 1934-1935 in the Antarctic with another large expedition, carrying out a program that on its scientific side is not very dissimilar to the one of 1928-1930. It is expected that during the coming Antarctic summer Admiral Byrd's flights will add by photographic survey an extensive territory to our present map of the Antarctic.



Simplified and re-drafted from maps of the American Geographical Society

— — — — — — Wilkins, 1928-29
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.... Mawson, 1929-30
———————— Byrd, 1928-29

Wilkins and Ellsworth in 1933-1934

In 1933 Lincoln Ellsworth planned to extend his already fine record in aerial exploration by making a flight across the Antarctic continent between the Ross Sea and the Weddell Sea. Thus he planned to carry out by air a journey which Shackleton had projected and which led him into so many difficulties. On this occasion Ellsworth had as his pilot and companion Bernt Balchen and Sir Hubert Wilkins as assistant and recorder of the expedition. While his ship, the "Wyatt Earp," was at the ice-barrier and his airplane, a Northrop Delta machine, was being unloaded a severe storm came up. The plane was so severely damaged as to make flight that year impossible. It was a severe blow to Ellsworth to have to give up the expedition for that season and return to America, where his plane has been re-built. With great courage and perseverance Ellsworth is now on his way to the Antarctic to undertake one of the most important tasks left in Arctic exploration.

THE WORLD, 1935

Beginning at the west or left-hand end of the map and then moving eastward:

Alaska: Aerial surveys of Alaska by United States government planes are proceeding rapidly each season. In Alaska and Canada also commercial flying is taking place over territories that a few years ago were unknown.

Islands of the Canadian Arctic: Stefansson's fine work made known the coast line of many of these islands. Some of the islands have been entered and a few crossed. The interiors of a number of these islands are still unknown or are known only as seen from the coast.

South America: In eastern Ecuador and eastern Brazil, at the headwaters of the Amazon there are regions poorly mapped and imperfectly known. The Amazon and all its main tributaries have been followed but between the streams there are tracts of forest that have probably not been crossed and are certainly poorly known.

In the Patagonian Andes there are ice-caps, probably similar to the Greenland ice-caps but on a smaller scale, which have not been investigated.

The Gran Chaco region has now for so many years been the seat of war that it is well known, though a few years ago it was still one of the little-known territories.

The Sierra Parima and a region between the Amazon and Orinoco systems still remains to be examined.

Greenland: Greenland has now been crossed a good many times and the ice-cap has been the subject of recent studies. The character of interior Greenland is generally well known, but there are tracts between the routes of the crossings which have not actually been visited.

Africa: The desert coast line of West Africa between Morocco and Senegal was still, until the last few years, a savage and inhospitable region. The deserts of French West Africa were little visited when the French air services to Dakar began. Airplanes making forced landings were burned by the natives and their pilots, murdered. Maps of the interior were very defective. Airplane travel has led to an improvement of facilities at coast stations and airplane surveys have added to knowledge of the western Sahara and Sudan. Travel by French motor buses, both governmental and commercial, has rapidly been extended. An attempt has been made to run a tourist motor bus across the desert to Timbuktu.

There are sections of Abyssinia little visited and very imperfectly mapped and also regions of Galla and other unfriendly tribes on borders of Uganda, Tanganyika and Abyssinia not often visited.

Arabia: The work of Philby and Thomas has recently made known regions in Arabia previously unvisited. The general character of south Arabia is now known but beside and between their routes there are extensive tracts still uncrossed.

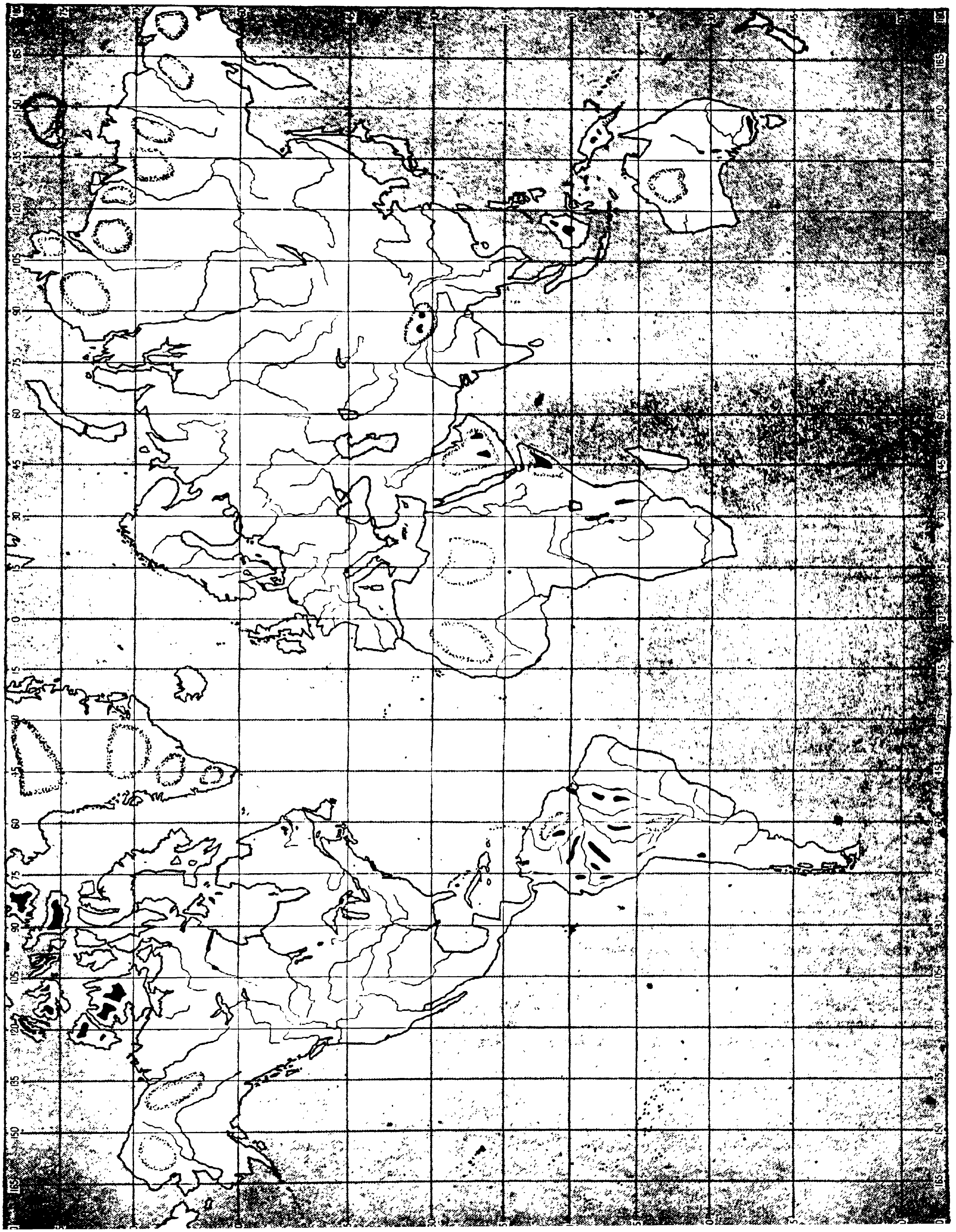
Tibet: Despite the extent of travel and survey in Tibet there are still regions to be investigated and more exactly mapped. The interiors of some of the Pacific islands remain unfamiliar, if not unvisited, territory. In Papua, or eastern British New Guinea, the discovery of a new mountain plateau and its tribes by Chinnery has been announced as this book goes to press.

Survey of Borneo has proceeded rapidly and the island is reasonably well mapped, though a few mountain regions in the interior probably remain unvisited.

Australia: Commercial and private flying in Australia is rapidly making known the last pockets of the bush and desert.

Siberia: The survey and exploration of Siberia and of the Siberian Arctic islands is proceeding so rapidly under the Soviets that only the regional experts can keep track of the situation. Traffic is being developed along the Siberian rivers. New colonies are being founded, scientific and commercial missions are being sent to the forests and the tundra. Ice-breakers and airplanes are surveying the Arctic and attempting to develop the Northeast Passage. Attempts are being made to maintain scientific stations and even colonies on the Arctic islands. Airplanes are being used for the making of maps and the maintenance of communication.

The Arctic and Antarctic unexplored areas remain approximately as shown on our maps of these regions. The next probable event in world exploration is that Byrd or Ellsworth will carry out by air the first crossing of the Antarctic continent.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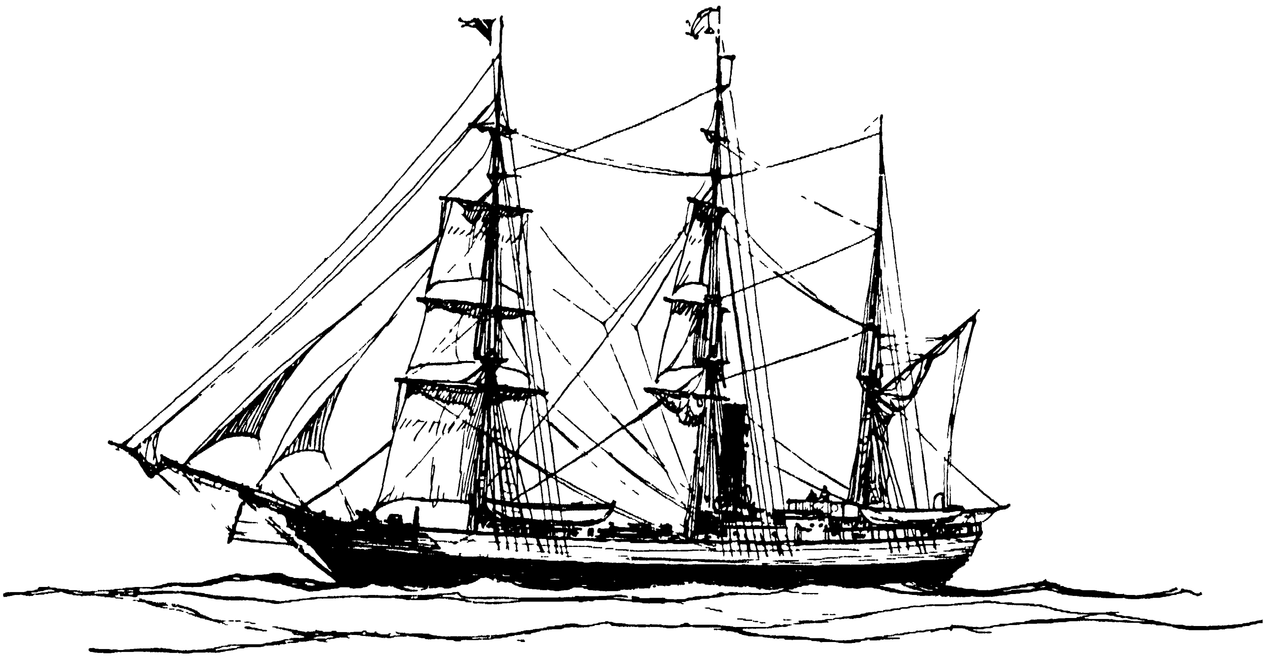


THE "CITY OF NEW YORK"

HERE is one of the latest of the historic ships of exploration. It was this vessel that carried Admiral Byrd and his company to the Antarctic in 1929-1930. But she might have been used for polar exploration work any time within the last 50 years, for she was built by K. Larsen in Norway as early as 1886.

She was built for the sealing trade and particularly for work about Greenland. Though not designed as a ship of exploration, she was equipped for this task. Her sail-plan and her hull-lines were all the result of long experience in sailing icy seas. She reënforces the lesson which we may have picked up by looking at the other ships of exploration, namely, that these have mostly been selected from the old, tried and serviceable ships of their particular time and country.

When originally built, the ship was called the "Samson." She made many voyages in the northern seas and on one of them carried a young man named Roald Amundsen. He went about his business, which was that of becoming one of the most famous of modern explorers. But he never forgot the staunchness and reliability of the "Samson." Many years later when talking with Admiral Byrd in New York, Amundsen remembered the ship and recommended her. She was then lying abandoned in Tromsö in Norway. Byrd bought her and reconditioned her and despite her age and her slow speed she served him well, carrying the polar party to and from the Ross Barrier through heavy Antarctic storms which might well have proved disastrous to faster, lighter and more modern vessels.

Some day, no doubt, someone will devise a completely new type of vessel for travel in Polar seas. But this will be difficult. Explorers are always finding out that local and well-tried methods of transportation are usually the best and safest for dealing with the extreme conditions that have accounted for their development.

PART X

CONCLUSION

EXPLORATION TODAY AND TOMORROW

IT is true that nearly every part of the earth's surface has been explored and that we can guess at the general characteristics of the few places that still remain untouched. There are no surprises left for the general explorer.

But it is also true that exploration is not dead. It has only reached a new stage or perhaps a succession of stages.

In the first place, there are still great areas of the world with which man has only a bowing acquaintance. There are millions of square miles of territory that have yet to be surveyed and mapped in anything like a comprehensive and scientific manner. Even in our own country there are from year to year expeditions going out to carry on this kind of work. In Central and South America there are interior areas and even coast lines that are imperfectly known and imperfectly described.

Not enough Americans are aware of the opportunities for adventure and useful service that are provided in carrying forward this less dramatic but very important kind of exploration. The American Geographical Society in undertaking the compilation and publication of the International Millionth Map of the whole of Hispanic America (the continent of South America, Mexico and Central America and the Caribbean Islands) is providing an unusual example of highly organized and brilliantly executed geographic research that has now extended over 14 years. On the millionth scale the assembled sheets would cover 320 square feet of space and represent an area of land and sea of over 12,000,000 square miles. For no other continuous area in the world of comparable size is there a uniform map of such large scale and such quality of compilation and reproduction. The compilation and library work on this map has been enormous but the influence of the work extends far beyond indoor geography. It has provided an incentive to South American governments to improve their surveys and has forwarded and assisted many expeditions into South American regions.

Perhaps the work on the Hispanic Map illustrates as well as anything could the degree to which exploration has become a coöperative and scientific enterprise. First, exploration is scientific in the sense that many methods of science are now applied to geographic study. The organization of a present-day exploring expedition implies the existence of a number, and frequently a great number, of coöperating scientists. Geography, geology, anthropology, botany, astronomy, physics and scores of special and particular studies are now a part of exploration. This means that exploration today involves more than rapid travel over extensive territory. It involves, also, the willingness of a number of men to go to a remote and uncomfortable part of the world and to settle there sufficiently long so that they may know this territory thoroughly in all its aspects. They must work out anew the relationships of the world of nature and the world of man as they are represented in this particular spot. It must serve as their laboratory. It must become as familiar to them as their laboratory at home.

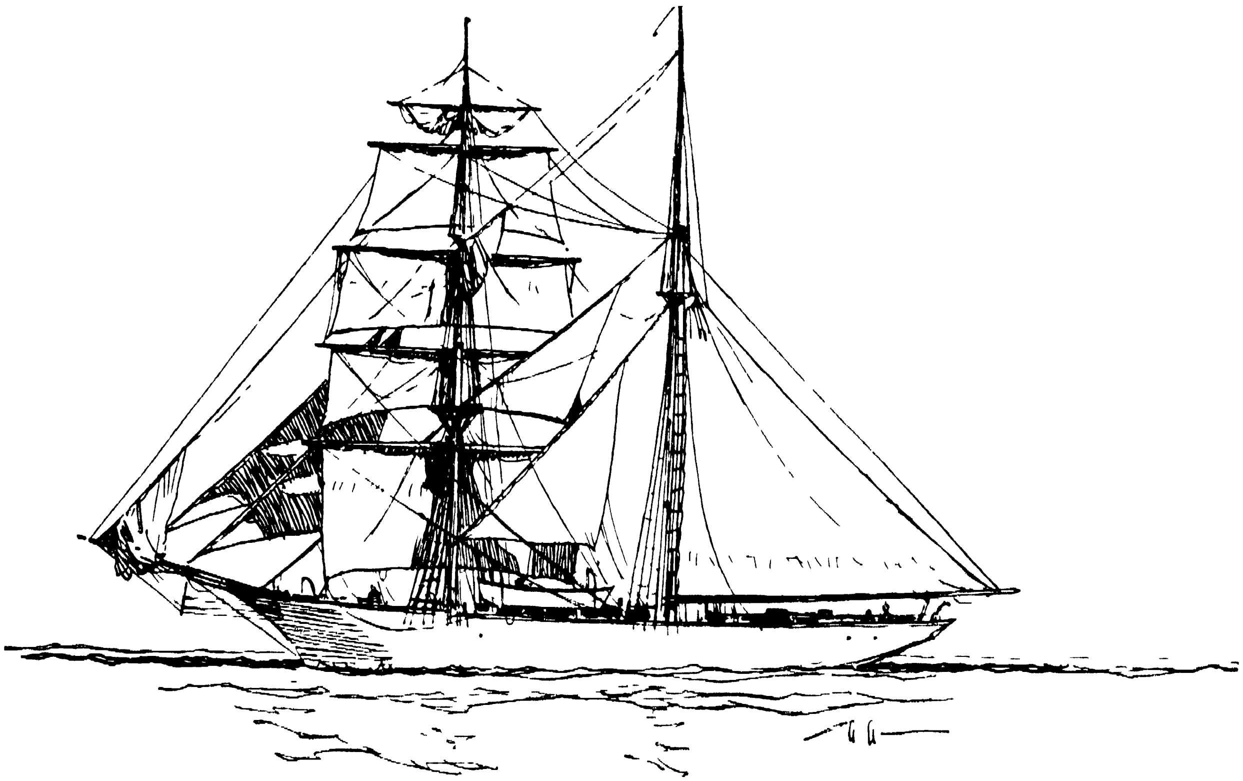
But there is a second and more profound change which has grown up out of the conditions of the first. It has come about that exploration is scientific, not only in the sense that it uses scientific methods but that the sciences themselves are now the chief objects of exploration. The interest was formerly in the territory explored. The interest is now in the sciences as they are exemplified in that territory.

The sciences of nature and of man must go afield to live. It is not a mere whim or a desire for notoriety that sends Compton racing around the world after the elusive cosmic ray; or that sends Wilkins in a submarine nosing under the Arctic ice like an old seal; or that sends psychologists and psychiatrists to work among the Eskimo or the Australian natives. Thank God that the world is still an almost infinitely varied and infinitely exciting place in which to live! From time to time man makes strenuous efforts to universalize and standardize the conditions of nature and the characteristics of his own behavior. Just now we are seeing some ludicrous and abhorrent attempts in this direction. If there is one thing of which we may be certain, it is that the variant conditions of nature and the mutability of human interest soon defeat these efforts. This is fortunate for the world of science as well as for the world of man. For science proceeds through noting the unity running through a series of infinite differences, by finding unexpected relationships in varied phenomena, by reconciling the apparently irreconcilable. And it is so in the world of man. Wisdom arises through observation of the varieties as well as the uniformities of human conduct and thought. In the joint cause of philosophy and science men must now, and for many years into the future, wander over the world in an endeavor to become genuinely acquainted with its richness and its complexity. Such activities save our natural sciences from sterility and formalism and they may save our philosophies and ethics from becoming the mere rules of the manipulator and tyrant of human conduct.

Finally we are witnessing today a change in exploration which may be of the greatest ultimate importance. Exploration is moving from a two-dimensional to a three-dimensional realm. We no longer explore the mere surface of the earth. It is not by accident that man has launched himself into the air and moved beneath the surface of the sea just in that period of history when the whole surface of the earth has become known to him. We are no longer content merely to map the ocean floor with the lead-line and the echo-sounding device. Beebe and Barton must shut themselves in a heavy metal sphere so that they may see and sense the life of the ocean half a mile below its surface. We are no longer content to fly in the heavy air we have so long known. We must move also in a lighter and more tractable gas. So Piccard and Settle and Stevens shut themselves in light metal spheres and are yanked into the stratosphere. It is not improbable that before I, who write these words, and you, who read them, are dead we shall look back upon the accomplishments of these men as gallant but puny efforts of man to explore the far worlds that lie about him.

WHY EXPLORERS EXPLORE

NOTHING is easier than to describe what men did—after their work is completed. It is almost equally easy to invent some likely explanation for their actions. The difficult, the almost impossible task is to know what really moved them to undertake explorations.



THE "CARNEGIE"

THE "Carnegie" was a unique ship in the world's history. She was one of the last and most interesting of the ships of exploration. She was the famous, non-magnetic ship built entirely without iron and steel, so that she might sail over the world's oceans and carry out complete and accurate studies of the earth's magnetism—that force which Einstein has endeavored to incorporate in his universal formulæ but which is still something of a mystery to science. Yet for thousands of years mariners have been guided by it, through trial and error have learned its erratic behavior and made it bring them safe to port.

Columbus and other early navigators became aware of declination or variation—that is, the difference, due to general or distant causes, by which magnetic north differs from true north. They thought this property might give them a method of finding their longitude. Until the development of accurate chronometers, the finding of longitude at sea was the great problem in navigation. This hope of the navigators was, however, soon abandoned, for it was discovered that the compass was subject not only to variation but to deviation, that is, local and individual error, to dip, to periodic changes in magnetic intensity, and to other unanticipated behavior. The "Carnegie" was built for the use of the Department of Terrestrial Magnetism of the Carnegie Institution at Washington to find the answer to these and similar magnetic eccentricities.

She was designed by Gielow of New York and built by Tebo in Brooklyn in 1909. She was white oak and yellow and Oregon pine. Copper and bronze composition were the only metals used. Even her auxiliary engines, which ran by gas, were especially constructed to eliminate magnetic metals so far as possible.

It is curious to note how the most forward scientific research at sea carried the builders of the vessel back to age-old and simple marine devices. Chain could not be used. The bronze anchor was bent instead to a manila hawser. This hawser had to be handled on an old-fashioned fisherman's windlass. Rope, instead of wire, was used in the standing and running rigging.

The "Carnegie's" hull lines followed in general those of a yacht, but were modified to give her greater carrying capacity and stability. Her rig was that of the well-tried and serviceable brigantine—that is, she carried all square rig on the foremast and all fore-and-aft on the mizzen, with staysails set between the masts. Originally she had on the mizzen a full mainsail and gaff topsail.

The "Carnegie" made six cruises between 1909 and 1921. She was then laid up for six years and was reconditioned in 1927. Her bronze engine, originally designed to run on producer-gas, was modified to run on gasoline, and many changes in her equipment were made. The large mainsail and gaff topsail had been abandoned during cruises in favor of the trysail or leg-of-mutton mainsail, which seems to have served her well. The "Carnegie" made a famous cruise in high latitudes about the Antarctic continents in 1915-1916. She sailed 17,000 miles in 188 days, of which there were winds of gale strength on 52 days. She once made a passage from New York to Hammerfest—4,800 miles in 24 days. The "Carnegie" had been in every ocean of the world—in fact, she had spun a whole spider web of courses over the world's oceans. She had sailed 343,000 miles when tragedy overtook her. She was loading gasoline at Apia, Western Samoa, on November 29, 1929, when she exploded and took fire. Captain J. P. Ault, who had commanded her on many of her voyages, died of his injuries and a cabin boy was lost.

The "Carnegie" and her work are evidences of the change of interest in exploration. In our day nearly all the great land masses of the world and nearly all the oceans have been explored. There are only a few untouched spots left, but exploration will go on. There is still a vast amount of detailed geographical investigation to be carried out. Many parts of the world are imperfectly known and very poorly mapped. The scientific investigation of the world is perhaps just getting well under way. The "Carnegie" and her workers represent an early evidence of the kind of special exploration that must be carried out on a great scale before man will finally be able to say that he knows his world.

By turning back through these pages we can see that exploration has been a long succession of historical triumphs and individual disappointments and failures. The explorer might almost be defined as the man who undertakes humiliating, arduous, torturing tasks with little certainty of economic or social reward. It is the common lot of explorers to drown at sea or freeze on the ice-caps, to die of thirst on the desert trail, to fall in battle, to be tricked and stabbed, to die of fever or of the spear-poison of a savage enemy. In the later record of exploration there are of course some exceptions to this rule. A few of the very great explorers of modern time such as Nansen and Peary have lived to do useful work and to occupy at last peaceful and honored graves. But this has not been the general rule. Over the long years of history even the explorers who have succeeded in reaching their geographical goal have all too frequently missed their personal objective. They have seen the rewards they had been promised snatched from them, have been neglected by the rulers or the governments they had served, seen the work they had accomplished overridden and set at naught. Why then did they go?

History, of course, gives a number of answers and these answers are at least superficially true. Men went for conquest. This was the reason that led the Ten Thousand Greeks and also Alexander to undertake their work as explorers. There have been several examples not so far removed from us in history where conquest or military advantage was a moving purpose in exploration.

Allied to conquest is the motive of plunder or of extraordinary commercial advantage. This motive is in part responsible for the adventures of the Portuguese and the Spaniards. It no doubt began as far back as the exploits of the Carthaginians and the Vikings.

Emerging from the motive of plunder and forced trade is the purpose of establishing or of strengthening a real trading relationship by which both parties may benefit or of scooping quick profit from the earth. This spirit has moved Canadian and American fur-traders, the miners, the prospectors, the whalers and scores of others.

Growing out of the economic motive and sometimes allied to it there has developed the scientific motive for exploration. It has been said that a distinction could be made between earlier and later exploration—that the earlier explorations were undertaken for wealth and power, and the later ones for science. Yet this is hardly a far-reaching classification. It is clear that Pytheas and Eudoxus had definite scientific ideas about their work as explorers and came home with creditable and new information. Few travelers that were worth their salt have failed to make some contribution to organized knowledge. Even Dampier who had a notable record as a pirate has been referred to as one of the most careful naturalists that ever slit a throat or sent a man to walk the gang-plank. In the end he was more interested in his notes on birds and flowers than he was in pirateering. He scolded his men and gave up raiding on his trip around the world because it interfered with his quiet hours for scientific study. Conversely, in our own day many expeditions start out under the banner of science whose real motives are commercial survey or prospecting or motion-pictures or the satisfaction of a personal vanity.

Clearly there is an array of motives to choose from. Yet when we choose, when we assess, when we balance hardships against the reward, it is hard to feel any one of them or even some special combination of them is adequate. It will not do—not wealth! So many explorers and prospectors and pioneers have had wealth before them, security and safety at hand, yet have turned away to a new and more desperate enterprise. Not reputation and honors! So many have come home from the field to find their reputation irksome and the crown of bay-leaves dusty, the taste of glory as flat in the mouth as a spent wine. In the religious worker and in the scientist there are motives that have had and continue to have some durable quality, some sustaining interest to bear a man through the years of frustration, of arduous work, of tenuous hopes that exploration involves.

Even so there must be some added feature, some special trait that spurs a man to fulfill his fate as an explorer, to work out his destiny in just these mountains or on just that sea. What is it? Discontent with fellow men, disgust with the muddied ways of the farm and the market place, the factory and the mine, the fumbling stupidities of armies and of courts—is it this? Is it hope of oblivion, is it forgetfulness of past defeats, is it the dream of straighter ways of life in a fresher and untainted land? Is it an absorbing joy in wonders and beauties that the earth still tenders to our understanding in lonely and removed places? Is it a sense of beauty lost to be recovered only in the pulsing silence of a great snowfield or in the crashing of a river torrent?

Perhaps that is it. Perhaps the motive and reason for exploration is to be found not by looking at rewards that this field promises, or seems to promise to its followers, but by turning our attention instead to the character of the men that do the exploring. Perhaps the important thing is not what the world offers but what the explorer himself brings to the task.

Here is a clue that might be worth following; it hints at a philosophy of exploration—the philosophy that the explorers themselves sense and live but seldom are able to express. The explorer, like the soldier and other men of action, is often inarticulate about his deeper purposes. Of course you would not suspect this when you look at the long heavy volumes that explorers sometimes write about their expeditions. But as you read you will find that 90 per cent of the volumes are given over to the externals of the task. They sometimes seem like floods of words which the explorer uses to keep from having to reveal his inner purposes. In the lesser men it is only in occasional flashes that the spark of the current that keeps the dynamo running is revealed to us. But there is the light of an abiding purpose in the works of the greater travelers—in the humanity and mysticism of Doughty, in the practical imperialism of Mackenzie, in the science of an Agassiz, a Humboldt, or a Darwin.

The trouble with reaching an understanding of the explorer is that the fascination of his task, the individual qualities he brings to it, the flare of genius in his accomplishment are revealed only when he is actually on the job and when he is removed from observation. This is one of the essentials of his work. This is one of the reasons why he may naturally in his writings and his public appearances fail to transmit an understanding of his work. The fact that explorers now sometimes move in large companies and that they are bound by radio to a listening world does not essentially alter this characteristic. It may even dull rather than intensify an understanding of the task.

It is also by looking at the man and not at the territory that the objects of exploration are seen to have a wider meaning than appears on the surface. There is no doubt that to the general public many of the immediate objects of exploration appear unimportant and incommensurate with the cost, the effort, the lives that have been expended in their attainment. This is not altogether a complete misunderstanding and it does not altogether arise from ignorance. It is a condition that actually exists. It must be clear to anyone who turns these pages that a great proportion of exploration has been carried out in the hope of discovering something that never had a real existence. We have only to recall Prester John, the Gilded Man, the hope of finding a sea passage through the American continent, a commercially practical route through the Northwest Passage or the Northeast, and scores of other fancies that have set men wandering. Even in our own day it is difficult to explain the urgency that has sent men to the North Pole and the South Pole and that has left them restless until they shall have photographed the last ice-field and brought back the ultimate survey of the Amazonian wilderness.

We must shift our point of view a little. Perhaps we must reverse it. Perhaps we must admit that from an immediate and practical point of view the discovery of Timbuktu and of Lhasa and the conquest of the Northwest Passage and the attainment of the Poles appear hardly to have been worth the effort. Asked point-blank why he has held these objects dear, the explorer is sometimes bewildered and embarrassed. Now he should say, or someone should say for him, that the meaning of these goals resides not so much in the goals themselves as in the value that human activity has given to them. Peary and Amundsen are not great explorers merely because they attained the Poles. The Poles are great and important because centuries of effort went to their conquest and because Peary and Amundsen captured the ultimate citadels and set a new landmark for human accomplishment.

The meaning of exploration resides not in the object or in the immediate accomplishment but in the human by-products, if the acceptance of the challenge, the awakening of the imagination, the development of character and the conquest of difficulty may be said to be by-products. In the end it is not difficult to understand this, for it has a reasonable biological background. This is why we do in fact understand and applaud the essential character of the explorer no matter how reticent his exposition or how halting the explanation he makes of his aims. Man is after all a questing animal. He shares the inquisitiveness of the apes; he must keep pushing his fingers into the crannies and chinks of the walls of his environment. He must shed the old skin; leave the old shell. A thousand social forces are put forth to keep him contented and well fed, to make him manageable, to tie him to safety and to home. But man seeks still further goals—a more exuberant life. The essential feature of a healthy organism is the capacity for growth. What exploration has discovered is not only the physical world but the very character of man.

BOOKS TO READ

Next to going on a voyage of exploration, the most absorbing thing is to read about one. Often, when the traveler is also a skillful writer, a man of art or science, he is able practically to take us with him. Often he may tell us experiences we should miss were we actually to make the trip, but to do so without his guidance. Herodotus, Marco Polo's *Travels*, Cook's *Voyages*, Darwin's *Journal*, Doughty's *Arabia*—these are not only important records of travel but also great literature. Indeed, literature in general owes much to the activity and interest of the traveler and many of the world's greatest books take the shape of a record of travel. The *Odyssey*, the *Æneid*, Dante's *Divine Comedy*, *Pilgrim's Progress*, *Don Quixote*, *Gulliver's Travels*, *Robinson Crusoe*, *Moby Dick*, Sterne's *Sentimental Journey*—what are these but the stories of men bent on various voyages of discovery?

The work of Richard Hakluyt is the ancient foundation-stone in exploration of all English-speaking peoples. What Chaucer was to poetry, or Shakespeare to the drama, that Hakluyt was to scientific adventure and travel. There are hundreds of adventure stories in Hakluyt's collected papers, but his purpose, to which he devoted a lifetime (1553-1616), was more serious than story-telling. He was anxious that English rulers, merchants and seamen should keep abreast of the Continental geographers, that they should improve the science of navigation and plant colonies everywhere. To his work the British Empire owes a great debt.

The best and fullest edition of Hakluyt is

HAKLUYT, RICHARD. Hakluyt's Collection of the Early Voyages, Travels, and Discoveries, of the English Nation. London, R. H. Evans, 1809-12, 5 vols.

But these volumes are very large and uncomfortable to handle. There is a more compact edition:

The Principal Navigations, Voyages, Traffiques & Discoveries of the English Nation. Edited by JOHN MASEFIELD. New York, E. P. Dutton & Co., 1927, 10 vols.

Hakluyt is also furnished in convenient form in the volumes of the Everyman's Library in 8 volumes.

There were men who carried on work similar to Hakluyt's, collecting other original accounts of travel, but none approached him in thoroughness and scholarship. Eden preceded him and Purchas and Pinkerton followed him.

Modern scholarship has often been able to simplify and straighten out the old accounts and sometimes to add new information. Since 1846, the Hakluyt Society has been publishing in England well-edited and carefully prepared accounts of historic explorations. They have published hundreds of useful volumes. The work of the editors is nearly always thorough and reliable and occasionally inspired.

In America similar work of editing and commenting on the great contributors to geographic knowledge is being carried out by the American Geographical Society.

There are two very good recent books that cover the general field of exploration:

BAKER, J. N. L. A History of Geographical Discovery and Exploration. New York, Houghton Mifflin Company, 1931. *A general handbook and reference book. Baker's footnotes and references indicate where most of the standard, scholarly materials are to be found.*

SYKES, SIR PERCY. A History of Exploration from the Earliest Times to the Present Day. London, George Routledge & Sons, Ltd., 1934.

A very interesting and readable book and one which is still the best for the field it covers is

BEAZLEY, C. RAYMOND. Dawn of Modern Geography. London, J. Murray, 1897-1905, 3 vols.

There is a recent book on the general field of the history of geography. It has the great merit of showing how you can continue your reading if your interest is still unsatisfied.

DICKINSON, R. E., AND HOWARTH, O. J. R. The Making of Geography. Oxford University Press, 1933.

On the two special subjects that form a part of Unrolling the Map, I suggest the following:

OF SHIPS

CULVER, HENRY B. The Book of Old Ships. Garden City, New York, Doubleday, Page and Company, 1924. *This has many accurate and spirited drawings by Gordon Grant. It is unfortunately out of print but it is still the most interesting and beautiful book on the subject.*

These are useful handbooks:

CLOWES, G. S. LAIRD. Sailing Ships: Their History and Development. London, The Science Museum, South Kensington, 1930.

HOLMES, SIR GEORGE G. V. Ancient and Modern Ships. Part I, Wooden Sailing-Ships. London, The Science Museum, South Kensington, 1910.

TORR, CECIL. Ancient Ships. Oxford, 1894.

OF MAPS

These are large, expensive and out of print. To be found in libraries. Together, these volumes cover the field:

Nordenskjöld, A. E., Ed. Facsimile-Atlas to the Early History of Cartography. Translated from the Swedish by Johan Adolf Ekelöf and Clements R. Markham. Stockholm, 1929.

—— Periplus: An Essay on the Early History of Charts and Sailing-Directions. Translated from the Swedish by Francis A. Bather. Stockholm, P. A. Norstedt & Söner, 1897.

On American maps in particular:

Fite, Emerson D., and Freeman, Archibald. A Book of Old Maps: Delineating American History from the Earliest Days down to the Close of the Revolutionary War. Cambridge, Harvard University Press, 1926.

For very fine reproductions of the historic maps of America:

Paullin, Charles O. Atlas of the Historical Geography of the United States. Edited by John K. Wright. Published by the Carnegie Institution of Washington and the American Geographical Society of New York, 1932.

The literature of travel and exploration is vast. It would be possible for me at this point to commence a lengthy and orderly bibliography of exploration, but I have concluded that this is not necessary or appropriate in a volume of this sort. Instead, I have selected for each period of exploration a few volumes that will tempt the fireside explorer. Most of these are selected because they are good reading, but I have tried to include in each section one or two scholarly works with booklists to take the reader further.

PART I

Cary, M., and Warmington, E. H. The Ancient Explorers. London, Methuen & Co., Ltd., 1929. *A good and scholarly book which covers the field. Has all the references to classical authors.*

PART II

Newton, Arthur Percival, Ed. Travel and Travellers of the Middle Ages. New York, Alfred A. Knopf, 1926. *A very good general volume. Has chapters on the Vikings, the Arabian travelers, the early routes to Asia, etc., by modern authorities.*

Thórdarson, Matthias. The Vinland Voyages. New York, the American Geographical Society Research Series No. 18, 1924.

Lamb, Harold. The Crusades. London, Thornton Butterworth Limited, 1930-31, 2 vols. *A moving, generally reliable account. See also work of Prof. Dana C. Munro and his pupils.*

—— Genghis Khan: The Emperor of All Men. New York, Robert M. McBride & Co., 1927. *A vivid picture of the Tartar period.*

Gibb, H. A. R., Translator, Ibn Battuta: Travels in Asia and Africa, 1325-1354. The Broadway Travellers. London. George Routledge & Sons, Ltd., 1929. *A most readable book about the Arabian traveler.*

Rockhill, W. Woodville, Translator. The Journey of William of Rubruck to the Eastern Parts of the World, 1253-55, as Narrated by Himself, with Two Accounts of the Earlier Journey of John of Pian de Carpini. London, the Hakluyt Society, 1900. *The best edition of the fascinating original accounts.*

Komroff, Manuel. Contemporaries of Marco Polo. New York, Boni & Liveright, 1928. *A convenient edition.*

Yule, Sir Henry, Tr. and Ed. The Book of Ser Marco Polo, the Venetian, concerning the Kingdoms and Marvels of the East. Revised by Henri Cordier. London, John Murray, 1903, 2 vols., third edition. *The standard edition. Everyone should be familiar with the Marco Polo story. It is not only good in itself but it leads to so many interesting inquiries and reflections.*

Cordier, Henri. Ser Marco Polo. London, John Murray, 1920. *This gives notes and addenda to Sir Henry Yule's edition. John Masefield's beautiful introduction to the Everyman's Library edition makes this volume doubly valuable.*

PART III

Beazley, C. Raymond. Prince Henry the Navigator: The Hero of Portugal and of Modern Discovery, 1394-1460 A.D. New York, G. P. Putnam's Sons, 1911.

Lord Stanley of Alderley. The Three Voyages of Vasco da Gama. London, the Hakluyt Society, first series, Vol. XLII, 1869.

Hildebrand, Arthur Sturges. Magellan. New York, Harcourt, Brace & Co., 1924. *A vivid and beautiful picture of the whole Portuguese adventure.*

Guillemard, F. H. H. The Life of Ferdinand Magellan. London, George Philip & Son, 1890. *Guillemard has all the facts but Hildebrand has all the interest.*

Pigafetta, Antonio. Magellan's Voyage Around the World. Translated by James Alexander Robertson. Cleveland, the A. H. Clark Co., 1906, 2 vols. *The best edition is of the journals of Pigafetta, who completed the first trip around the world in Magellan's ships. Wonderful.*

On Spanish exploration and the discovery of America the works of the older historical scholars still form the best general introduction, though their scholarship in matter of detail and their interpretations of character have not gone unchallenged in modern times. Among the works of this class are:

Irving, Washington. The Life and Voyages of Christopher Columbus. New York, G. P. Putnam's Sons, 1868.

—— Columbus and His Companions. New York, G. P. Putnam & Co., 1857.

Fiske, John. The Discovery of America. New York, Houghton Mifflin and Company, 1892, 2 vols.

Harrisse, Henry. The Discovery of North America. London, Stevens, 1897.

Helps, Sir Arthur. The Spanish Conquest in America. London, John W. Parker and Son, 1855-1861, 4 vols.

Bancroft, H. H. History of Mexico. Vol. 1, 1516-1521. Vol. 9 of The Works of Hubert Howe Bancroft. San Francisco, A. L. Bancroft & Company, 1883.

—— History of Central America. San Francisco, A. L. Bancroft & Company, 1883.

Prescott, William H. History of the Conquest of Mexico. New York, Harper & Brothers, 1844, 3 vols.

—— History of the Conquest of Peru. New York, Harper & Brothers, 1847, 2 vols.

There are a number of recent books dealing with particular Spanish explorers which are interesting as well as informative:

Columbus, Christopher. Journal of First Voyage to America. With an introduction by Van Wyck Brooks. New York, Albert & Charles Boni, 1924.

Strawn, Arthur. The Golden Adventures of Balboa. London, John Lane, Ltd., 1929. Also published in New York by Brentano's, 1928, under the title Sails & Swords.

Bishop, Morris. The Odyssey of Cabeza de Vaca. New York and London, the Century Co., 1933. *An interesting and readable book, which also gives a picture of general conditions during the Spanish conquests in America.*

The Journey of Alvar Nuñez de Vaca, and His Companions from Florida to the Pacific, 1528-1536. Translated by Fanny Bandelier, edited by Ad. F. Bandelier. New York, Allerton Book Co., 1922. *One of several translations of original de Vaca journals. Another is by Buckingham Smith.*

Diaz, Bernal. Memoirs. . . . Containing a True and Full Account of the Discovery and Conquest of Mexico and New Spain. Translated from the Spanish by John Ingram Lockhart. London, J. Hatchard and Son, 1855, 2 vols. *The Mexican Conquest as seen by one of the conquerors.*

MacNutt, Francis Augustus, Tr. and Ed. Letters of Cortés: The Five Letters of Relation from Fernando Cortés to the Emperor Charles V. New York and London, G. P. Putnam's Sons, 1908, 2 vols.

Hodge, F. W., and Lewis, T. H. Spanish Explorers in the Southern United States, 1528-1543. New York, Charles Scribner's Sons, 1907. *Also about de Soto, including the papers of the Gentleman of Elvas.*

Shay, Frank. Incredible Pizarro: Conqueror of Peru. New York, the Mohawk Press, 1932. *A modern and popular volume on Pizarro.*

Graham, R. B. Cunninghame. Pedro de Valdivia: Conqueror of Chile. London, William Heinemann Ltd., 1926. *An excellent account. I find Valdivia an interesting character.*

—— Hernando de Soto: Together with an Account of One of His Captains, Gonçalo Silvestre. New York, Lincoln MacVeagh, the Dial Press, 1924.

Medina, José Toribio. The Discovery of the Amazon, According to the Account of Friar Gaspar de Carvajal and Other Documents. Translated from the Spanish by Bertram T. Lee and edited by H. C. Heaton. New York, American Geographical Society Special Publication No. 17, 1934. *All of the available and pertinent material on Orellana.*

Markham, Sir Clements. The Conquest of New Granada. London, Elder & Co., 1912. *The Quesada story well told.*

PART IV

Brebner, John Bartlet. The Explorers of North America, 1492-1806. The Pioneer Histories, edited by V. T. Harlow and J. A. Williamson. London, A. & C. Black, Ltd., 1933. *A good and readable book on the general exploration in North America. A good guide to further reading.*

Among the older works are three books of Francis Parkman:

Parkman, Francis. The Jesuits in North America in the Seventeenth Century. Boston, Little, Brown and Company, 1899.

—— Pioneers of France in the New World. Part I of France and England in North America. Boston, Little, Brown and Company, 1878.

—— The Struggle for a Continent. Edited from his writings by Pelham Edgar. Boston, Little, Brown and Company, 1907.

Relating particularly to Canadian exploration are two excellent volumes by Burpee:

Burpee, Lawrence J. The Discovery of Canada. Ottawa, The Graphic Publishers, Limited, 1929.

—— The Search for the Western Sea: The Story of the Exploration of North-western America. London, Alston Rivers, Ltd., 1908.

Cartier, Jacques. The Voyages of Jacques Cartier. Translated with notes and appendices by H. P. Biggar. Publications of the Public Archives of Canada No. 11, Ottawa, F. A. Acland, 1924. *Cartier's own journals are more interesting than anything that has been written on him.*

McFee, William. The Life of Sir Martin Frobisher. The

Golden Hind Series. New York, Harper & Brothers, 1928. *An excellent life of Sir Martin Frobisher.*

CHAMPLAIN, SAMUEL DE. Voyages of Samuel de Champlain, 1604-1618. Edited by W. L. Grant. The Original Narratives of Early American History. New York, Charles Scribner's Sons, 1907.

PARKMAN, FRANCIS. La Salle and the Discovery of the Great West. Part III of France and England in North America, Boston, Little, Brown and Company, 1894. *Still the best book on La Salle.*

Hearne and Mackenzie are both worth sampling in the original accounts:

HEARNE, SAMUEL. A Journey from Prince of Wales's Fort in Hudson's Bay to the Northern Ocean. Introduction and notes by J. B. Tyrrell. Toronto, Publications of the Champlain Society, Vol. 6, 1911.

MACKENZIE, ALEXANDER. Voyages from Montreal Through the Continent of North America to the Frozen and Pacific Oceans in 1789 and 1793. Toronto, the Radisson Society, 1927.

LEWIS, MERIWETHER, AND CLARK, WILLIAM. History of the Expedition Under the Command of Captains Lewis & Clark. Reprint of the Biddle Edition of 1814, with an account of the Louisiana Purchase by Prof. John Bach McMaster. The American Explorers Series, New York, Allerton Book Co., 1922, 3 vols. *Despite the important and adventurous character of their expedition, the writings of Lewis and Clark are not particularly interesting.*

BROOKS, NOAH. First Across the Continent. New York, Charles Scribner's Sons, 1901. *A general account of the expedition.*

HEBARD, GRACE RAYMOND. Sacajawea. Glendale (Calif.), the Arthur H. Clark Company, 1933.

FRÉMONT, JOHN CHARLES. Memoirs of My Life. Chicago and New York, Belford, Clarke & Company, 1887. *Frémont was a vivid character and aroused controversy.*

DELLENBAUGH, FREDERICK S. Frémont and '49. New York and London, G. P. Putnam's Sons, 1914. *A general account of his relation to Western exploration.*

NEVINS, ALLAN. Frémont: The West's Greatest Adventurer. New York and London, Harper & Brothers, 1928, 2 vols. *A modern and favorable view.*

GOODWIN, CARDINAL. John Charles Frémont: An Explanation of His Career. Stanford University Press, 1930. *A less favorable analysis.*

PART V

RALEGH, SIR WALTER. The Discoverie of the Large and Bewtiful Empire of Guiana. Edited from the original text, with introduction, notes and appendices by V. T. Harlow. London, the Argonaut Press, 1928. *An excellent edition of the papers of Sir Walter Raleigh.*

CHIDSEY, DONALD BARR. Sir Walter Raleigh: That Damned Upstart. New York, the John Day Company, 1931. *A modern and vivid account of his life.*

LA CONDAMINE, CHARLES MARIE DE. Abridged Narrative of Travels Through the Interior of South America. In John Pinkerton's Collection of . . . Voyages and Travels in All Parts of the World, Vol. 14, pp. 211-269. London, Longman, Hurst, Rees, Orme and Brown, 1813.

HUMBOLDT, ALEXANDER VON. The Travels and Researches of Alexander von Humboldt; Being a Condensed Narrative of His Journeys in the Equinoctial Regions of America, and in Asiatic Russia. Edited by W. Macgillivray. New York, J. & J. Harper, 1835. *A condensed account.*

DARWIN, CHARLES. Voyage of the "Beagle." Everyman's Library. *One of the greatest books on travel.*

BATES, W. H. Naturalist on the Amazons. Everyman's Library. *See text on Bates.*

WALLACE, ALFRED R. A Narrative of Travels on the Amazon and Rio Negro. London, Macmillan and Co., 1870. *No modern edition available.*

PART VI

I now select a few books that give a picture of early travel in Asia and that reveal personalities fascinating in themselves:

VARTHEMA, LUDOVICO DI. The Itinerary of Ludovico di Varthema of Bologna. Translated from the original Italian edition of 1510 by John Winter Jones. London, the Argonaut Press, 1928.

CORYAT, THOMAS. Coryat's Crudities. London, W. Cater, 1776, 3 vols.

BARBOSA, DUARTE. The Book of Duarte Barbosa. Translated from the Portuguese by Mansel Longworth Dames. London, the Hakluyt Society, 1918-1921, 2 vols.

MUNDY, PETER. The Travels of Peter Mundy, in Europe and Asia, 1608-1667. Edited by Lt.-Col. Sir Richard Carnac Temple. Cambridge, the Hakluyt Society, 1907, 4 vols. *A strange and terrible book.*

HUC, ÉVARISTE RÉGIS. . . . Huc and Gabet. Travels in Tartary, Thibet, and China. Edited by P. Pelliot. The Broadway Travellers. London, G. Routledge & Sons, Ltd., 1928, 2 vols. *Abbé Huc has been called the most imaginative of travelers. Makes a nice transition between the early travelers and the later scientific explorers.*

PREJEVALSKY, N. Mongolia. Translated by E. Delmar Morgan with an Introduction and Notes by Colonel Henry Yule. London, Sampson Low, Marston, Searle, & Rivington, 1876, 2 vols.

——From Kulja, Across the Tian Shan to Lob-Nor. Translated by E. Delmar Morgan. London, Sampson

Low, Marston, Searle, & Rivington, 1879. *Prjevâlsky writes well and furnishes vivid descriptions.*

Hedin, Sven. Through Asia. New York and London, Harper & Brothers, 1899, 2 vols.

——A Conquest of Tibet. Translated from the Swedish by Julius Lincoln. New York, E. P. Dutton & Co., Inc., 1934.

Andrews, Roy Chapman. The Conquest of Central Asia: A Narrative of the Exploration of the Central Asiatic Expeditions in Mongolia and China, 1921-1930. Vol. I of Natural History of Central Asia, Chester A. Reeds, Editor. New York, the American Museum of Natural History, 1932.

——On the Trail of Ancient Man: A Narrative of the Field Work of the Central Asiatic Expeditions. New York and London, G. P. Putnam's Sons, 1926. *A more popular version.*

I enjoyed Lattimore's and Warner's modern books which deal with the ancient methods of travel in Asia.

Lattimore, Owen. The Desert Road to Turkestan. London, Methuen & Co., Ltd., 1928.

Warner, Langdon. The Long Old Road in China. New York, Doubleday, Page & Company, 1926.

Doughty, Charles M. Travels in Arabia Deserta. With introduction by T. E. Lawrence. London, Jonathan Cape, 1921, 2 vols. *See text on Doughty.*

Beazley, Raymond, Forbes, Nevill, and Birkett, G. A. Russia: From the Varangians to the Bolsheviks. Oxford, the Clarendon Press, 1918. *Includes an account of Siberian Exploration.*

Golder, F. A. Bering's Voyages: An Account of the Efforts of the Russians to Determine the Relation of Asia and America. New York, the American Geographical Society, 1922-25, 2 vols. *Includes Steller's very interesting Journals.*

PART VII

Loon, Hendrik Willem van. The Golden Book of the Dutch Navigators. New York, the Century Co., 1916. *The Dutch have played a great part in the Pacific. Their voyages make a good approach to this area.*

Thiéry, Maurice. Bougainville: Soldier and Sailor. London, Grayson & Grayson, 1932.

La Pérouse, J. F. G. de. Voyage round the World. London, Lackington, Allen, and Co., 1807, 3 vols. and atlas. *Long but entertaining.*

Cook, James. The Three Famous Voyages of Captain James Cook round the World. London, Ward, Lock, and Co., 1889 (?). *Captain Cook's journals, of course, are long and of the greatest importance. It is almost impossible to take the book up without becoming fascinated in his endless adventures, in his fresh accounts of beautiful islands seen for the first time by European eyes. This is also available in the Everyman's Library.*

Dampier, Captain William. Dampier's Voyages. Edited by John Masefield. London, E. Grant Richards, 1906, 2 vols. *To be reckoned among the fascinating bits of reading. Here notes on history and nature are to be found embedded in narratives of sea adventure and piracy.*

PART VIII

Brown, Robert. The Story of Africa. London, Paris, Melbourne, Cassell & Company, Limited, 1892, 4 vols. *An excellent book to introduce us to Africa, popularly written and still full and accurate.*

Johnston, Sir Harry H. The Opening Up of Africa. New York, Henry Holt and Company, 1911.

White, Arthur Silva. The Development of Africa. London, George Philip & Sons, 1892, 2nd edition. *Has a set of maps of Africa, prepared by E. G. Ravenstein which includes one dealing with explorations.*

Park, Mungo. The Life and Travels of Mungo Park: With the Account of His Death from the Journal of Isaaco. New York, Harper and Brothers, 1840. *The best edition.*

Lander, Richard and John. Journal of an Expedition to Explore the Course and Termination of the Niger. New York, J. & J. Harper, 1832, 2 vols. *Lander wrote in a fresh and entertaining manner, but his journals are not often read.*

Burton, Isabel. The Life of Captain Sir Rich'd F. Burton. London, Chapman & Hall, Ltd., 2 vols., 1893. *The original summary of his work by his wife.*

Downey, Fairfax. Burton: Arabian Nights Adventurer. New York and London, Charles Scribner's Sons, 1931.

Baker, Sir Samuel W. The Albert N'Yanza, Great Basin of the Nile, and Explorations of the Nile Sources. Philadelphia, J. B. Lippincott & Co., 1870. *The most interesting of Baker's journals.*

Livingstone, David. The Last Journals of David Livingstone in Central Africa. Edited by Rev. Horace Waller. New York, Harper & Brothers, 1875. *Much has been written by and about David Livingstone. I feel that his own journals give us the best picture of the man and of his work.*

Stanley, Henry M. How I Found Livingstone. New York, Scribner, Armstrong & Co., 1872.

——In Darkest Africa. New York, Charles Scribner's Sons, 1891. *The most widely known books on African travel. Stanley was certainly in his day a competent journalist. Perhaps this accounts for the fact that his writings seem somewhat lacking in interest today.*

PART IX

Mirsky, Jeannette. To the North! The Story of Arctic Exploration from Earliest Times to the Present. New

York, the Viking Press, 1934. *A reliable and interesting general history of Arctic exploration. Contains a useful bibliography.*

Mill, Hugh R. The Siege of the South Pole. New York, Frederick A. Stokes Company, 1905. *A delightful, general volume on Antarctic exploration.*

The history of Antarctic exploration is still in the making and Professor Mill's book may be supplemented by reading two publications of the American Geographical Society:

Joerg, W. L. G. Brief History of Polar Exploration Since the Introduction of Flying. New York, the American Geographical Society, Special Publication No. 11, 1930.

Joerg, W. L. G., Ed. The Work of the Byrd Antarctic Expedition, 1928-1930. New York, the American Geographical Society, 1930.

Two volumes of a scholarly and scientific character are

Brown, R. N. Rudmose. The Polar Regions: A Physical and Economic Geography of the Arctic and Antarctic. London, Methuen & Co., Ltd., 1927.

Nordenskjöld, Otto, and Mecking, Ludwig. The Geography of the Polar Regions. Edited by W. L. G. Joerg. New York, the American Geographical Society, Special Publication No. 8, 1928.

There are countless books dealing with individual explorations in the Arctic and Antarctic. From these I select a number that seem to me characteristic of their period in exploration. They are stories of great adventures told in an individual and great manner:

Veer, Gerrit de. The Three Voyages of William Barents to the Arctic Regions. Edited by Lt. Koolemans Beynen with an introduction. London, the Hakluyt Society, 1876.

Ross, Sir James Clark. A Voyage of Discovery and Research in the Southern and Antarctic Regions, During the Years 1839-43. London, J. Murray, 1847, 2 vols.

Nordenskjöld, A. E. The Voyage of the *Vega* round Asia and Europe. Translated by Alexander Leslie. London, Macmillan and Co., 1883.

Nansen, Fridtjof. Farthest North. New York and London, Harper & Brothers, 1898, 2 vols.

Nordenskjöld, Otto, and Andersson, Dr. Joh. Gunnar. Antarctica. New York, The Macmillan Co., 1905.

Amundsen, Roald. Roald Amundsen's "The North West Passage." London, Archibald Constable and Company, Ltd., 1908, 2 vols.

Peary, Robert E. The North Pole. Its Discovery in 1909 under the Auspices of the Peary Arctic Club. New York, Frederick A. Stokes Company, 1910.

Scott, Captain R. F. Scott's Last Expedition. London, Smith, Elder & Co., 1913, 2 vols.

Shackleton, Sir Ernest. South: The Story of Shackleton's Last Expedition, 1914-1917. London, William Heinemann, 1919.

Stefansson, Vilhjalmur. The Friendly Arctic. New York, The Macmillan Co., 1927.

Owen, Russell. South of the Sun. New York, The John Day Company, 1934. *Interesting and important because it reflects how men live under the conditions of modern Polar exploration.*

Adams-Ray, Edward, Translator. Andrée's Story: The Complete Record of His Polar Flight, 1897. New York, The Viking Press, 1930. *The fascinating and tragic record of the Andrée expedition.*

Amundsen, Roald, and Ellsworth, Lincoln. The First Flight across the Polar Sea. London, Hutchinson & Co., Ltd., 1926.

Wilkins, Sir Hubert. Flying the Arctic. New York and London, G. P. Putnam's Sons, 1928.

Byrd, Richard Evelyn. Little America. New York and London, G. P. Putnam's Sons, 1930.

Lunn, A. H. The Englishman in the Alps. Oxford, 1913. *An excellent introduction to the literature of mountain travel, with extracts from Tyndall, Mummery, Freshfield, etc.*

Freshfield, Douglas W. The Exploration of the Caucasus. London, E. Arnold, 1902, 2 vols. *A fine example of the older mountain explorers.*

Filippi, Filippo de. Karakoram and Western Himalaya, 1909. An Account of the Expedition of H.R.H. Prince Luigi Amedeo of Savoy, Duke of the Abruzzi. London, Constable & Co., Ltd., 1912, 2 vols. *Beautiful volumes telling of the Duke of the Abruzzi's work.*

Younghusband, Sir Francis. The Epic of Mount Everest. New York, Longmans, Green & Co., 1927. *General account of the Everest Expeditions. There are separate volumes by Lt.-Col. Howard-Bury, by Bruce, and by Lt.-Col. Norton.*

PART X

Two volumes on ultra-modern methods of exploration into new realms:

Fisk, Dorothy. Exploring the Upper Atmosphere. Oxford Press, 1934.

Beebe, William. Half Mile Down. New York, Harcourt, Brace and Company, 1934.

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